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OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS

VOL. VII. JANUARY, 1911 No. 2

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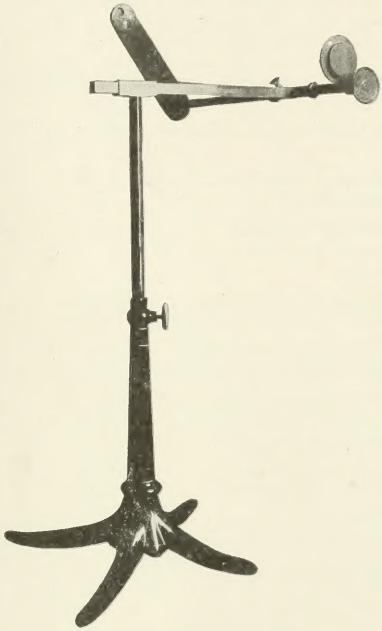

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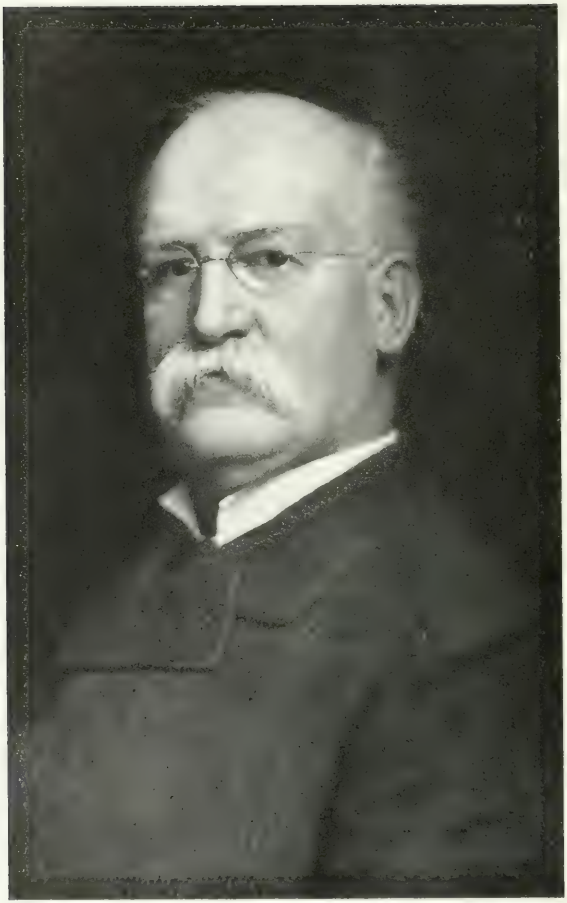

A. W. Calhoun.

OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

Vol. 7. JANUARY, 1911 No. 2.

Original Articles

AN "UNLEARNABLE" VISION TEST CARD FOR USE IN THE NAVAL SERVICE.

By Surgeon E. J. Grow, U. S. Navy,

WASHINGTON, D. C.

(Formerly Instructor in Ophthalmology, U. S. Naval Medical School.)

The best method for the determination of visual acuity has long been the subject of much controversy, especially since 1843, when Küchler first published a test chart constructed on somewhat scientific principles and which, with various modifications, may be considered as the basis of vision testing in use today.

Prior to that date very little was accomplished in this line; no charts were in use and little information was gained that could be considered as adding any light on the subject, with possibly one exception. In 1674 Robert Hooke determined that the normal eye could not clearly distinguish objects that subtended an angle at the eye of less than one minute. This measurement having stood the test of time is still accepted as correct and made use of in the construction of the most modern vision test charts.

The history of the various improvements in charts which have been made in the last sixty years by Arlt, Donders, Jaeger, Snellen, Green and many others, furnishes most interesting reading. The literature on the subject is voluminous. Any attempt to even simply enumerate principles devised would occupy much space and would be manifestly out of place in an article of this kind. A most exhaustive series of articles on the subject have recently been printed by Pergens (Annales d'Oculistique, 1906-7).

Strange as it may seem, the vision test charts in present use give a very imperfect indication of the visual acuity actually present in any given case, not only from the fact that the size and style of the test letters vary considerably, but also because no two letters in the alphabet are seen with equal distinctness under the same visual angle.

To obviate this latter defect several charts have been devised having objects other than letters for the patient to read or count, as the disks of Striedenger (Statistical and Sanitary Report, 1860), or the broken circles of Landolt (Graefe's Arch. f. Oph. Bd., LXIV). Although these schemes have considerable theoretical value, the disadvantages overbalance their advantages and would hardly be sufficiently practical for our use in the navy.

So-called Snellen's charts are in general use the world over, yet it is impossible to obtain an original Snellen's chart in this country. The charts sold as Snellen's, which are everywhere seen, are constructed more or less closely in conformity to his principles, but with the letters varying materially in size and shape according to the ideas of the numerous publishers.

To illustrate, the writer has collected over 30 different test charts published and used in the United States, and after careful measurement it was found that the size of the letters, which should be seen at the distance indicated on each line, did not correspond in any two charts. Considering the line of letters which should be seen at 20 feet (20/20 line) there was a variation in the size of these letters on the different charts from 7.4 mm. square as a minimum to 10.6 mm. square as a maximum. As we do most of our work in the navy with the 20/20 line, one can readily see that it would make a vast difference to the candidate, slightly defective in vision, who was desirous of entering one of the various corps, whether he was tested by a chart with letters constructed according to the former or latter measurement. Yet this is taking place every day. Many of our test cards which are furnished by different optical firms vary so much in respect to the size of the letters that the acceptance or rejection of a candidate may, and often will, depend on the particular test card used. This also accounts, in a measure, for the discrepancy in the visual acuity as determined by medical officers in the navy from the result that the candidate often obtains from a physician in civil life.

Snellen found that a letter which subtended an angle vertically and horizontally of five minutes (the component line of the same subtending an angle of one minute) at the nodal point of the eye was a fair test for the determination of normal visual acuity. This is known as Snellen's principle. He also stated that many persons have a far greater vision than this, and that this measurement represented only a minimum; and that if the person examined did not have at least this amount of vision he could not be considered as having normal eyesight.

This is generally accepted as the standard in the manufacture of test letters in all civilized countries, and one would at first think that there was no excuse in not having the letters on charts of different manufactures of such size as to conform with this principle, providing his plan was to be followed. But we are at once confronted with the problem: Shall we construct our letters as if measured on the chord or tangent of the angle of five minutes, or shall we do as has been recommended in this country—strike a mean and use twice the tangent of half the angle of five minutes? It will be readily seen that the size of the letters will vary according to the method we select. Snellen's original charts vary themselves in the size of the letters and as he has published several different styles of charts, we cannot construct a similar chart ourselves unless we are informed as to exactly which one we are to select for our guide.

The lack of unformity in the size of the test letters used in the Navy is unfortunate as it produces inconsistent records. We, at least, should be consistent with ourselves and have a uniform standard. The new card submitted has this as one of its objects.

As the Navy Regulations require that Snellen's principles should be followed, a series of test letters have been constructed which will subtend an angle of 5 minutes vertically and horizontally, at the nodal point of the eye according to the distance indicated. The letters are drawn on a plane representing 2 tang. $\frac{1}{2} - 5'$, this being the measurement generally used.

Example: 2 tang. $\frac{1}{2} - 5' = .0014544$.

20 feet = 6093 mm.

0.0014544 X 6093 = 8.86 mm. (for the 20/20 line).

Therefore the letters should be about 8:86 mm. square and the new test charts have been constructed on this measure-

ment. The lines of the letters have been drawn of such width that they will subtend an angle of one minute, thereby fulfilling Snellen's principle.

At long as we in the United States Navy use the line of let-

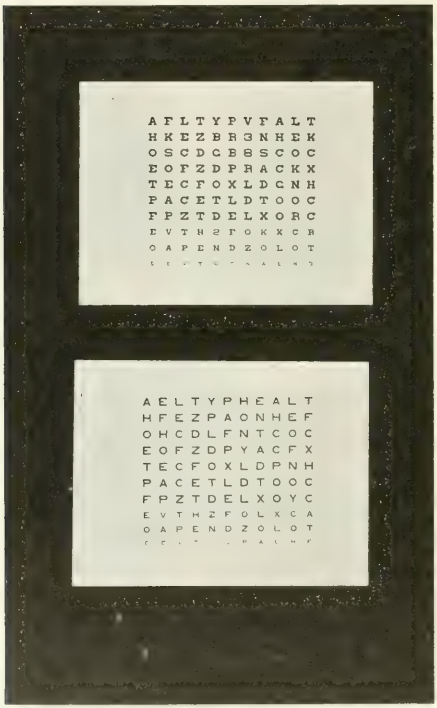

Fig. 1 and Fig. 2

ters which should be normally seen at 20 feet as the basis of our visual measurement, it is not necessary to have letters which should be seen at greater distances. It is of little advantage in a Navy recruiting office to require the applicant to read all the larger letters usually found on test charts with

each eye; in fact it is a waste of time. The question is—can he read the 20/20 line of letters at 20 feet; if not, at what distance can he read them? Consequently, in the proposed test charts, all of the larger letters are omitted.

For the purpose of recording better vision, as for example, among our gun pointers when 20/15 vision is required in the sighting eye, additional lines of letters proportionately smaller, have been constructed all in conformity to the above mentioned principle. It might be added that all the letters were first drawn as accurately as possible on paper and then photographed. From the negative a copper plate was made with unusual care to insure clean cut edges and perfect alignment of the letters. The gothic type is recommended. (Fig. 2.) The block type (Fig. 1) has been used for about two years, but is for our purpose in many ways not as satisfactory.

The Illumination.—Doubtless diffuse sunlight would come the nearest to an ideal illuminant, but it is not practicable, as it varies in intensity through too wide ranges, and obviously is not at our command.

Artificial illumination is imperative and should be of such quantity as to well illuminate the cards. Oguchi[1] states that the measurement of the visual acuity depends upon the amount of light used, and that the ability to read a test chart decreases proportionately to the cube root of a diminishing light intensity. It has been found that a light of between 30 and 50 meter candles gives the best results. With a long test chart, such as is in general use, it is difficult to evenly illuminate it unless the O'Brion light is installed. In the accompanying illustration it will be seen that the bracket is so arranged as to increase or decrease the intensity of the light as the operator desired. This can be done within sufficient limits. A 32-candlepower filament electric light is now used, and when an electric current is available a steady and ample illumination of the card can always be obtained, which is very essential to insure accurate and consistent results.

The desirability of having a chart that eliminates the possibility of the candidate being able to learn the letters either intentionally or unconsciously is apparent. Any intelligent person who reads the 20/20 line at 20 feet with one eye unconsciously for the moment partially memorizes the letters and uses the knowledge so gained to aid him in reading with the

other eye; if the other eye happens to be defective an erroneous interpretation of his vasual acuity results, and if the letters are memorized intentionally an accurate result of the real vision is not obtained. Memorization of the ordinary test charts is not a difficult matter. With practice and study almost any number can be learned, and provided that the reader can read the larger letters on the top of the card, he is able to give all

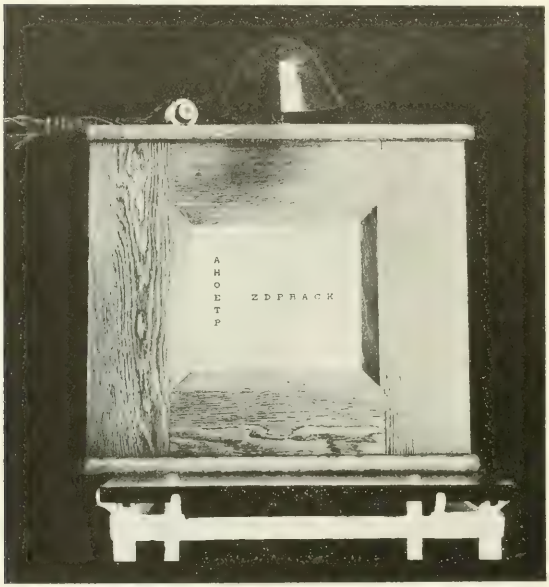

Fig. 3. Front View.

those remaining. In the case of a candidate who nearly but not quite meets the requirements for the Navy, the learning of a single line is enough to enable him to pass successfully, and when considerable depends upon meeting the visual test the temptation to memorize the letters is great. That this is done is known to almost every medical officer, and with our present methods of testing vision, the examiner is never sure

whether previous knowledge of the card has entered into his determination or not.

A suggestion might be made that we keep our charts under lock and key when not in actual use or have a chart made that would not be found in general use, but even with these precautions others besides the medical examiner necessarily would have access to them and soon be familiar with the "special chart" and before long the secret would be out. (This has been tried.)

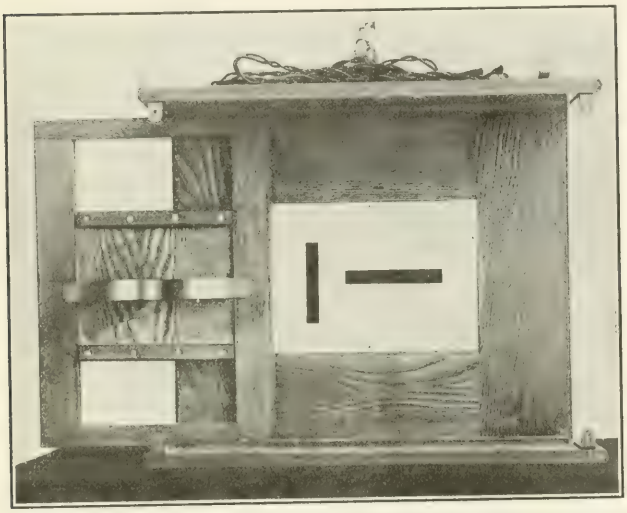

Fig. 1. Rear View, Slide Open.

Inasmuch as we rely principally on the candidate reading the 20-foot line, it might be suggested that the ordinary test card could be used, having a rider with a slot in it sufficiently large to show only one letter at a time and by moving the rider back and forth successive letters are presented at random, thus precluding the possibility of taking advantage of previous memorizing of the letters. An excellent idea, providing all the remaining letters on the chart are covered at the same time, but if, as is generally the case when this method is used, the next

line above is seen in its entirety, the candidate, if his vision is not too low, can read the letters in the slot even if he does not see them, by learning the position of the slot with reference to the larger letters above which he does see.

The writer had a case of a bugler, 15 years old, who could read the letters presenting in the slot, even though the slot was covered by a piece of paper. He did this by first having learned the position that each letter bears with reference to the lines above which he could see.

It is astonishing to what extremes some candidates will go to enable them to pass the visual requirements, especially when a life occupation is at stake, simply because they lacked, by 3 or 4 feet, the ability to read the test letters at the required distance.

By the method generally in use the medical examiner is never certain whether the candidate has learned the letters or not, and his first suspicion may be aroused by receiving a letter from the bureau announcing the fact that so and so, whom he passed a month previously, has been surveyed and discharged from the service on account of defective vision, existing prior to enlistment.

The new chart proposed is constructed with a view to eliminate this constant source of error. The chart shown (Figs. 3, 4 and 5) is made with the idea of securing:

First. Uniform test letters (Snellen's).

Second. Adequate illumination.

Third. An "unlearnable" set of letters.

A glance at the illustrations will show the method in which the test card is operated. The frame which supports the bracket holding the electric light is not absolutely necessary but is a great convenience, for various groups of letters which are thrown into view are always under the same illumination. The operator does not known the letters presenting until he observes them himself. The candidate under examination has no guide to assist him and if he reads the letters presenting correctly he must see them. The numerous combinations or groups of letters which can be instantly thrown into view are too many for him to memorize, and although he may learn every letter on the card in their sequence, that knowledge would be valueless when the test is applied, for he reads only the

letters which the operator throws into position and he cannot pronounce them unless he actually sees them, which is the object desired. In other words, the candidate can have possession o the chart and any knowledge he can gain thereby will be of no assistance in aiding him to deceive as to his actual visual acuity.

For traveling recruiting parties and for use aboard ship the

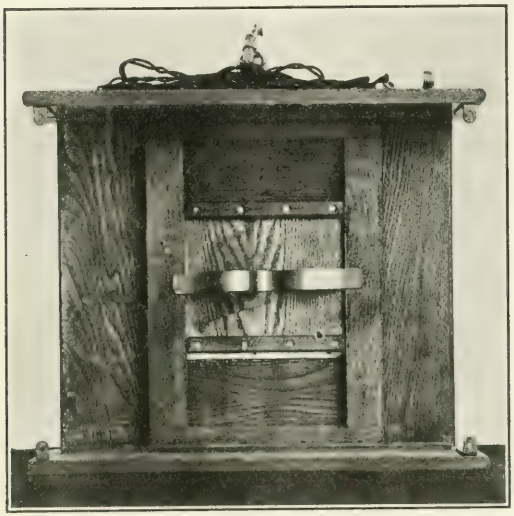

Fig. 5. Rear View, Slide Closed.

bare card is sufficient. Take a piece of white blotting paper, cut a slot in it of sufficient length and width as will show as many letters as desired, place it over the test card and it will be found that over a hundred combinations of letters can thus quickly be exposed for observation.

The question of illumination in this case must be solved individually. The card should be placed in diffused sunlight if possible, or if this is impossible, the best artificial illumination at hand must be used.

This chart has been in use over two years and has proved satisfactory.

While this chart is designed for use in the U. S. Navy, yet it would be of value to physicians and others in civil life who conduct the visual examinations for candidates in the railway service, police departments, etc.

The cards and cabinet can be had from Meyrowitz & Co., New York.

CYCLOPHORIA.

By A. A. Bradburne, F. R. C. S. Ed.

Southport, England.

Constant and sustained over-action on the part of any muscle or set of muscles entails a severe drain on the nervous system. When the cause which gives rise to this strain is unrecognized the results are further aggravated, for the simple reason that the pernicious action persists despite the futile attempts to counteract the results.

In no other branch of medicine is such a state of matters more likely to occur than in the quiet but persistent forms of muscular strain which accompanies trifling optical defects of the eyes.

As a proof of the statement that it is the small inconsiderate and seemingly trifling optical defects that give rise to the most trouble, one has only to recognize the fact that if an optical defect of high degree be present the same cannot be overcome without causing *immediate* discomfort which calls for *immediate* attention and rectification.

Hence it is amongst those minor degrees of astigmatism or muscle imbalance that can be neutralized by a slight excess of muscular effort that one finds the evidences of strain.

The smaller the error the less noticeable it is, and naturally the longer it lasts before becoming manifest, and the greater degree of mischief it entails.

It is not the man who *cannot* see the small letters on the test board who suffers from nausea, headaches, and general lassitude; no, it is the individual who with self-assurance born of confidence in his sound vision fluently reads off all the letters and yet unwittingly misnames such letters as Ps, for Bs; Es, for Fs; Ts, for Fs; etc. Give such an individual his correct glasses to remedy the trifling error, and you obtain the most surprisingly pleasing results.

That all this is only too true is now becoming daily more recognized since so much more attention is being paid to eye work, yet a good deal still remains to be done in regard to accurate and correct treatment of those minor defects associated with the subject of the muscle balance of the eyes. To a cer-

tain extent it is true, ocular muscle imbalance is more dependent upon, and secondary to constitutional conditions than other ocular defects, that is, in the majority of cases of muscle imbalance attention to optical defects and adoption of remedies directed at restoring the general system, will produce better results than attacking the muscles themselves. However, there is a condition of muscle imbalance which is the direct outcome of attempts made to rectify optical defects and this condition is known as Cyclophoria; it is true that this condition can and does arise from causes inherent in the eyes themselves, but under these circumstances a train of symptoms soon arise which leads the investigator to the source of trouble early.

The type of Cyclophoria to which I wish to draw attention is that which is the outcome of errors in prescribing glasses. It is trifling in degree, but from this very fact persists for years, working its baneful ills without being detected or even thought of. Hence its results are of the first magnitude. The truth of such a statement is proved by the fact that recently I had under my care a case in which the condition of Cyclophoria had persisted unrecognized for twenty-five years, during which period it had, owing to its having escaped notice, brought about a condition of the nervous system which had almost wrecked a useful life. Had he not been carefully examined by eminent nerve specialists, who told him that he had no nerve lesion whatever, and that the whole of his symptoms were attributable to his eyes, one would think, when one saw him, that one was in the presence of a grave organic nerve disease. That the detection of these cases is not easy is proved from the fact that this patient had at different times consulted four ophthalmic surgeons, had taken all sorts of special treatments at the hands of able physicians and of drugs no end, and all to no benefit and that all these symptoms were due to the most trifling of errors, shows that the subject is worthy of a little more attention than has been given to it in books and clinics.

By Cyclophoria we mean a tendency to abnormal rotation of one or both eyes about a fore-and-aft axis. To make this plainer one must recall to mind the axes around which the eyeball moves. They are three. One a Vertical axis in which the motion of the eye is similar to that of a weather cock: a second around a horizontal axis, in which the motions are the same as those of a looking-glass, and third one round an antero-posterior axis

forming a wheel-like motion. It is to this lash or wheel-like motion to which Cyclophoria refers. The movement itself about this fore-and-aft axis is known as Torsion, and before we can fully appreciate the condition of Cyclophoria we must understand the various factors that have to do with Torsion.

The principles bearing upon the subject of the turning of the eye upon its own antero-posterior axis are so complicated that even Helmholtz himself, one of the greatest authorities, fell into error in stating a law on the subject. However I will endeavor to put the chief points relating to the subject as simply as possible.

First of all there are two axes about which Torsion can take place, viz. an antero-posterior one drawn through the center of the eyeball itself and corresponding to the visual axis and a second belonging to the socket of the skull and the head itself; some authorities deny that any rotation takes places about the former axis.

The agents which bring about Torsion of the eyes are the superior and inferior recti and the oblique muscles.

The next point to understand is, that for certain positions of the eyes a certain degree of Torsion is normally present.

This is best seen if we examine the position of the eyes when the line of regard is directed down and in, as for instance in the acts of reading or writing. Here the eyeball will be drawn in by the action of the interni recti muscles, down by inferior recti which will at the same time, owing to their relation to the eye, also rotate the Vertical meridian outwards. Now the Superior Oblique will also assist to move the eyeball down and at the same time rotate the Vertical Meridian *inwards*, in this respect neutralizing the torsional effort of the inferior rectus.

We thus see that in this position with the lines of regard directed down and in: That the interni recti act as convergers and the inferior recti act as depressors and also as tilters of the superior end of the Vertical diameters of the eye outward.

To counter balance this Torsion a compensating action on the part of the Obliques is necessary and as their action is an entirely independent one, governed by the will, any *special* compensatory effort must entail a strain on the nervous system.

In the interest of clear vision when the gaze is thus directed, a certain amount of tilting out of the meridians is necessary and as the three pairs of muscles act almost automatically, the

agency of the obliques is practically just equal to the demands for modifying the tilting.

When however certain circumstances arise in which the compensatory tilting action of the obliques is called into excess, it gives rise to further complications: for in addition to their torsional effects the obliques have power to modify the rotation, elevation and depression of the eyes.

In the circumstance under consideration with the gaze directed downward and inward an excess of action on the part of the obliques would also restrain the converging action of the interni and supplement the depressor action of the inferior recti.

Perhaps if one takes for example the reading of a line of type in a book it may help to simplfy the subject. Here the gaze is directed down and in and on each retina is received a horizontal image of the line of letters. If the impression fall equally on corresponding parts of each retina, but one impression will be received by the brain. Consider however what happens if any *abnormal* torsion be present, here the horizontal lines of letters will appear to cross each other, owing to the fact that they do not fall upon the correct portions of each retina. It is true that this phenomena of crossing of the lines of type is not recognized, as the desire to obtain fusion is too strong to permit double vision except in high degrees. To overcome this want of alignment of the lines a special effort on the part of the obliques becomes necessary, and this special effort as we have shown entails also alterations in the horizontal elevation and on the lateral position of the eyes.

Thus it is plainly seen that in any individual in whom an abnormal state of Torsion existes, viz. the condition of Cyclophoria, a very great strain is thrown on his ocular muscles by the efforts made to maintain convergence on a near object.

Then there is another aspect of the subject which is one I fancy escapes the consideration it deserves. It is this, if a condition of Cyclophoria comes into play when the gaze is directed at a near object, the neutralizing action of the obliques will, when the convergence is maintained for any lengthened period, lead to a tendency for these muscles to become fixed in their fresh position. Hence when once more the gaze is directed straight ahead, or for other positions, a state of Torsion will be present which did not exist before. Thus it is plain that if, by

inadvertence or ignorance of the laws relating to Torsion, we produce a condition of Cylophoria for near Vision we at the the same time add also the same for distant sight. We now come to the consideration of the causes, detection and treatment of Cylophoria.

Regarding the causes. As the maintenance of the horizontal or vertical meridians of the eyes is dependant on the accurate adjustment and action of the oblique muscles any affection of these muscles or their nerve supply will produce a condition of Cylophoria. The causes which can effect these muscles and nerves are too many and their train of symptoms on the Vision too obvious for any need to enumerate them here.

There is however another cause of Cyclophoria which arises when there is no affection of either the oblique muscles or their nerve supply. It is this cause which I fancy has not received the notice it deserves and for that reason, as well as the unrecognized symptoms to which it gives rise, I am drawing attention to it. The cause I refer to is that which arises from faulty prescribing of cylindrical lenses. Many medical men, to say nothing of the prescribing optician, are daily accustomed to prescribe glasses and are constantly yet unknowingly falling into the error of incorrectly ordering the axes of the cylinders. A cylinder I may remind you is a lens which deflects rays of light in one direction only, viz.: at right angles to its axis. Rays passing in the same direction as the axis are not deflected at all. Cylinders are given to correct astigmatism. Now if we place a cylinder in the trial frame and look through it, at, say the horizontal or vertical lines of a window, we will see if we slowly rotate the cylinder that these lines move or become bent. The direction of the movement depends on whether we employ a convex or a concave lens. If however we reverse matters, that is keep the cylinder in one axis and move the eye it is obvious that a similar movement in the vertical or horizontal positions of such lines will naturally occur. This is what in fact takes place when one wears cylindrical eyeglasses. I have already pointed out that without glasses a Torsion naturally takes place when the eyes move from the primary position of looking straight in front, if then the eyes have to look through a cylinder which was correct for the primary position it is obvious that it cannot be *in the correct axis for the eyes when directed for a near point.*

When the cylinder is of small amount the extra action of the obliques, to correct the torsion, will alter the line of elevation only a little, and for near work this can be compensated by altering the tilting of the head. When however the cylinder is a strong one or only present in one eye the effects of the torsion will be all the greater and therefore the more difficult to overcome.

We now turn to the methods for detecting and treating the condition. In some cases as I have said the complaint of certain objective phenomena on the part of the patient may lead us to suspect the presence of Cyclophoria, if we are aware of the existence of such a condition. He may say that the margins of his book are not parallel, that the edges tend to slope towards each other either at the top or bottom. Again he may complain that after much near-work when he comes to lift his head up that the ground is not level. This symptom is very important and the nature of the torsion can be gauged from the direction in which he says the ground seems to slope. In one of my cases the patient said, when he looked up, the horizontal line of the mantlepiece seemed to have a dip in the center. This is the only case I have met with in which complaint was made in regard to the horizontal meridian, for as a rule the desire to maintain this meridian level is so strong, that the fusion faculty will not tolerate any disturbance of it. Indeed it was the presence of this very fact, that by forcing a perfect horizon for his near work, brought about a cramp of the oblique muscles which they could not drop when the eyes resumed the primary position, which made it become manifest to the patient. Symptoms of general nerve debility appearing in a patient wearing glasses and doing much near-work should always lead one to investigate for the presence of the condition.

As regards the detection and correction of Cyclophoria arising from the faulty position of cylinder, it fortunately is not difficult. It can be detected by the simplest of objective testing in those cases where it is of sufficient amount to give rise to much trouble.

Let us take, for example, the treatment of an actual case. Seat the patient in a good light and put on the trial frame with his reading lenses accurately adjusted for near work. In his hands put a large, clean sheet of neutral tinted paper, on which draw a single straight line, opposite one eye insert in

the trial frame a double prism with the bases opposite the center of the pupil. Cover the eye which has not the prism in front of it. Then ask the patient to move the sheet of paper about in front of him until he sees two lines. Two lines will be seen owing to the action of the double cylinder in front of this eye. It is obvious then that on uncovering the fellow eye three lines will be seen, the middle one belonging to the latter eye. Ask the patient to state exactly whether the middle line is parallel or if it slopes. If it be parallel no Cyclophoria for near vision exists. If, however, it slopes then slowly move the cylinder in the direction which brings this middle line into parallelism with the others. When such has been obtained cover up the prism covered eye and see if the patient can, with the cylinder in this new axis, read the small type of the ordinary reading test. If he cannot, move the cylinder back again a few degrees and test once more for parallelism with the double cylinder. When the axis is found in which the small letters can be read and the three lines are parallel this then is the correct axis in which the cylinder should be ordered for "near" work.

The test is a very simple one and at the same time informs one of the presence of excess or deficiency of convergence. This feature is elicited by ascertaining whether the ends of the three lines are flush. If the center one projects to the opposite side beyond the other two, the convergence is deficint; if it project over towards the same side as the eye without the prisms on, then excess of convergence is present. Which of these conditions is present can easily be ascertained in another way by putting prisms in front with the apex in or out until the lines are brought flush.

Instead of using a single line, a line of very small letters with a single larger letter in the middle can be employed, at the same time, when testing, it is necessary to ask the patient to name the letters. By this means we stimulate the ciliary muscle and as the actions of convergence and accommodation move "pari passu" an excess of accommodation will also show its effect on the balance of the eyes for convergence or on the torsion.

To sum up, then. There is a condition of torsion which is normally present in the position of the eyes for near work. That this torsion requires to be considered when giving cylinders

to correct astigmatism. That unless such condition be correctly reckoned with and treated a very serious state of matters may ensue as a result of the extra strain which it throws primarily on the oblique muscles of the eyes and secondarily on the whole nervous system through them.

THE ETIOLOGY, PATHOLOGY AND TREATMENT OF CONCOMITANT, CONVERGENT SQUINT.

By Dr. Linn Emerson,

ORANGE, N. J.

That concomitant convergent squint is so little understood by the laity is the greatest reproach to the medical profession and indirectly to us, the ophthalmic members of the profession, on account of our failure to teach the general practitioner more in regard to this disfiguring malady.

What is so conducive to tears in a girl, or profanity and blows in a boy, as the derisive appellation of "cock eye"?

Since practically all cases can be, at least, cosmetically cured, is it not a reproach to our profession that this is not more universally known?

That the general practitioner has failed to properly instruct the laity regarding this condition is owing to the fact that he has not an intelligent knowledge of the disease himself.

The ophthalmologist, while discussing the subject before the various special societies, has failed to bring the matter to the notice of the general practitioner in a manner to enlist his cooperation.

In my practice I see a procession of cases in which the family doctor is said to have advised "leaving the child alone, as he would outgrow it when older"; "not to put glasses on such a small child," assuring the parents that when the child was seven years old, a simple operation would bring about a complete cure, etc., etc., *ad infinitum.*

After seeing a small child with squint at a most favorable age for cure by orthoptic measures, and explaining the obvious advantages of this plan of treatment, what is my chagrin to learn that the family does not care to undertake it, because it is discountenanced by their family physician. Many times he quotes the opinion of some oculist of much greater age and experience, who "does not take much stock in that sort of thing."

This condition of affairs is in some measure due to the fact that (as Worth so pertinently states) a single symptom is mistaken for the whole disease.

How many general practitioners are aware of the fact that

there is any condition present other than the abnormal convergence of the visual axes? The prime causes, a defect in the fusion faculty and the presence of an error of refraction, are little appreciated. In a large percentage of cases there is also lowered vision of the eye not used for fixation, congenital amblyopia, or amblyopia ex anopsia.

As to whether deficiency of the fusion sense is always the prime cause of concomitant squint, I can only say to the doubters that in a careful observation of some five hundred cases, I have never seen a case in which this faculty was not deficient or absent.

It does not seem to me that Worth does this theory justice, since he does not clearly differentiate the fusion center and the fusion sense or faculty.

Duane, in Posey and Spiller (page 182) specifically refers to a fusion sense, and a fusion center.

As we have a speech and an auditory center, there is no question in my mind that we have a fusion center. The presence of this center is obviously necessary for the development or manifestation of a fusion faculty. But its loss or absence is not the only cause which will produce deterioration or loss of the fusion faculty.

Given congenital, orbital or muscular abnormalities, congenital or acquired amblyopia, anisometropia of high degree, and the fusion faculty may fail to develop, even though a fusion center may be present.

In fact, the rapid development of the fusion faculty, after correction of high degrees of refractive error and the inauguration of fusion training, and also its deterioration in some cases after cessation of proper treatment, point to it as a developmental faculty.

Worth arbitrarily divides the fusion faculty into three grades, but in reality there are "57 varieties" or grades, and I empratically affirm that in all cases of concomitant squint this faculty is in some degree deficient.

Why does the esophoric patient, no matter how great his refractive error, so seldom become an esotrope?

Because his fusion sense is so well developed.

To my mind it is a misnomer to refer to cases of heterophoria as latent squint. No doubt some cases of heterophoria are latent

squint, but a majority of them have good fusion sense and will *never* become squinters.

The structural defect, or the refractive error may be the cause of the lack of development of the fusion sense, but the deficiency of the fusion sense is the cause of the squint.

A clear understanding of this squint would, to my mind, reconcile all the conflicting theories as to the cause of squint.

As to the statement that Worth's theory does not explain divergent strabismus occurring in myopia from the seventh to the twelfth year, after the development of good fusion, I would say that as the fusion sense is a development faculty, and capable of marked improvement by training, so it is capable of rapid deterioration, and my own observation has shown that while these cases have early diplopia, there soon is suppression of one of the images and a rapid deterioration of the fusion faculty.

I desire to repeat that I have never seen a case of squint (other than paretic) in which the fusion faculty was not deficient or absent.

As to treatment, I feel it is our duty to permit no opportunity to escape for driving home to the general medical profession the fact that *no* child is too young to begin treatment for convergent squint.

To that end I would urge the members of this society to avail themselves of all opportunities to read papers and present cases before local, county and state societies.

Cases seen during the first few months of life should have a weak solution of atropin instilled in the fixing eye two or three times a week, but should be observed at occasional itnervals, as I have seen two cases in which the atropin was continued for a long period without advice, and the squint transferred.

The prognosis in these very young children should be guarded, as Posey has pointed out, since in many instances there are congenital or traumatic conditions (from birth injuries) which preclude the acquisition of good vision or the cure of the deviation by methods other than operative.

While I have succeeded in a few instances in prescribing glasses under one year of age, I generally wait until the child is 16 or 18 months old, and sometimes am obliged to postpone until even older.

If treatment can be begun before the age of four, the prognosis in uncomplicated cases is good.

I give full correction in the fixing eye and + 50 D. S., less in the squinting eye.

A 5 per cent. solution is instilled in the fixing eye every morning, and the occlusion pad is used from one-half to three hours daily.

As soon as the child is old enough, the amblyoscope is used in the office, and the stereoscope, with Kroll's or Well's pictures in the home. I have also found the plastograms of value.

Acting on some suggestions from Dr. N. M. Black and myself, Hardy & Co. have made a series of pictures for the amblyoscope which are more interesting to children than the ones sent out with their first pattern.

Dr. Black has also devised a most ingenious method of illuminating the slides of the amblyoscope.

As the case improves, it often becomes necessary to put a drop of atropin in the squinting eye at less frequent intervals than in the fixing eye.

In these cases and in the alternating cases in which I use atropin in both eyes, I have found that bifocals (+ 3.00 D. S. pasters) lessened the squint and accelerated the cure.

As to the percentage of cures by this method of treatment, it is not possible to make a fair estimate. After treating several hundred cases in both private and dispensary practice, I should say that about 50 per cent. are not cured because of failure to carry out the treatment. In view of this fact I now advise operation much earlier than formerly in cases where the social condition and intelligence of the family does not seem to promise active cooperation.

In private practice, however, patients of good social condition who carry out the treatment with intelligence and perseverence, practically all get well.

Recently I have been much impressed with the value of the combined plan of treatment, in which the operative procedures are performed relatively early and the orthoptic treatment continued.

As to the operation selected and the time of its performance, there can be no hard and fast rules.

Age of the patient, the social condition, the amount of vision,

the amount of deviation and wishes of the family must all be given consideration.

There can be no doubt that advancement is the safest and wisest procedure, but whether on one or both eyes, can only be decided at the time of operation. Double advancement will not correct all cases, and frequently it must be followed by a guarded tenotomy.

I have been doing Landolt's operation, as modified by Wood ton, for several years, but I have recently devised an operation, which I shall call the "split tendon" operation, which seems to give me more satisfaction. Its principal advantage is that it can be performed under local anaesthesia, and if, after the operation is completed, sufficient effect is not obtained, as extensive a tenotomy as is necessary can be performed at the same sitting.

No scleral sutures are used.

After cocainization, the conjunctiva overlying the insertion of the superior, inferior and external recti is raised and two or three drops of 2 per cent. cocain or alypin solution is injected at their respective insertions.

The conjunctiva is opened by a strong vertical incision at the outer corneo-scleral margin.

Above and below it is extensively undermined, as in the McReynolds operation for pterygium.

The muscle is freed and taken up on a hook or with the Prince forceps. About two millimeters from its insertion a double threaded silk ligature is passed through the upper half of the tendon from within outward, forming a loop on the under surface of the tendon. A similar ligature is passed through the lower half of the tendon. These two sutures are passed in the manner usual to most advancement operations, with the exception that they are far forward in the tendon and not in the muscle.

The tendon is now dissected from the globe as closely as possible, thus carefully preserving the tendonous ends, which prevents the sutures pulling out, as often happens where the tendon is cut off.

The cut end of the tendon is now split longitudinally 4 or 5 millimeters and the halves are anchored above and below, underneath the undermined conjunctiva. This is done by passing the two needles on each suture far under the undermined

conjunctiva and tying the ends over the narrow bridge of conjunctiva exactly as is done in the McReynolds operation for pterygium.

As the conjunctiva forms little or no anchor for the muscles, one of the sutures is now passed deeply under the tendon of the superior or inferior rectus, after it has been raised in the strong grasp of a fixation forceps.

The suture is now drawn tight in the form of a loop around this muscular tendon, and each half of the split tendon closely approximates the tendon of the rectus, to which it is anchored.

As in all muscle operations, the effect of the operation can not be foretold.

This operation, performed under local anaesthesia, possesses the advantage that the immediate effect is the ultimate effect, as there is little probability of the stitches pulling out.

If the effect of one advancement is not sufficient, the second eye may be at once advanced. If after this still more correction is desired, a careful tenotomy of one or both opposing recti may be performed.

In one or two instances I have slightly increased the effect of advancement by putting in a scleral suture at the corneoscleral margin, this suture including the conjunctiva as well as the middle portion of the muscle.

I have performed this operation under local anaesthesia in children as young as five years.

I am now aiming to get all the correction desired at one sitting.

The after treatment consists of atropin and occlusion of both eyes for one week.

Of various other operations I have little to say. In the hands of operators who are familiar with them they no doubt bring good results.

I must, however, confess to a fixed prejudice against Panas' stretching operation. This prejudice is founded on the observance of divergence following it in four or five cases in my own practice and the observance of about a dozen similar cases after operations by other surgeons.

A REPORT ON SIXTY CASES OF TRACHOMA TREATED AFTER THE COOVER METHOD.

By H. H. Martin, M. D.

SAVANNAH, GA.

The Coover method of treating trachoma may be briefly described as follows: The lids are everted and the conjunctiva thoroughly scrubbed with sandpaper which has previously been sterilized by pouring alcohol over the surface, setting fire to the alcohol and allowing it to burn off. I had the pleasure of seeing Coover operate by this method in June, 1909, prior to that time I had always operated for trachoma with Noyes forceps. I was much impressed with the sandpaper operation, but did not agree with Coover that the operation was sufficient in itself to cure this disease. My observation having been that copper-sulphate or some other specific for this disease is essential to a complete cure after any of the surgical measures.

In the late summer of the same year I discovered sixty cases of trachoma among ninety-eight boys, inmates of an orphan home near Savannah. I divided these sixty cases into four groups of fifteen each. The first fifteen were treated after Coover's method unmodified, the remaining forty-five were treated after the Coover method modified as follows: Instead of burning alcohol or making any other attempt to sterilize the sandpaper, I used the sandpaper just as it came from the shop, but immediately after the operation the conjunctival sac was copiously irrigated with normal salt solution in order to clear the sac of any loose grains of sand; the lids were then everted and thoroughly scrubbed with gauze sponges and a one to five-thousand bichloride solution (this was done also in the first fifteen). In the entire sixty cases there was no evidence of infection having occurred during the operation. I am convinced therefore that any attempt to sterilize the sandpaper is troublesome, unsatisfactory and entirely unnecessary. Immediately after the operation the patients were kept in bed until they had recovered from the anesthetic, but no dressings or local applications were used. In ever instance the boys were in their places in the school room the next day after the operation.

The first group of fifteen had no after treatment of any description. In the remaining forty-five a saturated solution of copper sulphate (40 grains to the ounce) was dropped into each eye once a day for eight weeks. Ten months after the completion of this series of operations these sixty cases were all carefully examined for trachoma with the following results: In the fifteen cases which were treated strictly by the Coover method without after treatment there were twelve recurrences (80 per cent.). In the forty-five cases where the copper-sulphate was used as above described there were but six recurrences (13 per cent.). I wish to explain also in this connection that these operations were all done in the dormitory of the orphan home, no operating-room being available, and that the after treatment was carried out by very inexperienced attendants. Had the after treatment been carefully and thoroughly carried out, there is every reason to believe that there would have been no recurrences in those cases in which the copper-sulphate was employed after operations.

Summary.

The scrubbing out of the granulations with sandpaper (No. 00 or 0) is by far the most satisfactory operative procedure yet devised in the treatment of trachoma. No operative procedure is sufficient in itself to cure this disease. All of them should be followed up for from four to eight weeks with some specific treatment, a saturated solution of copper-sulphate being the most satisfactory in my experience. If the conjunctival surface be thoroughly flushed with a normal salt solution and scrubbed with a one to five-thousand bichloride solution after the completion of the operation, sterilization of the sandpaper is entirely unnecessary. Any narrow blade thumb forceps will serve for everting the lids. The time consumed in operating averaged one hour and a half for each fifteen cases, two anesthetists and two nurses assisting.

AN UNUSUAL FACTOR IN AMBLYOPIA.

FRED MCKEMY RUBY, A. B., M. D.,

UNION CITY, INDIANA.

The following case is presented in the belief that it is of a class uncommon, if not rare. The literature at my command shows no case of the same type, neither am I satisfied to classify it under any of the common heads. The history of the case is as follows:

Lester C., aged seven years, was referred to me on March 18th, 1908, for examination because of poor vision. Patient was a healthy, lively little chap with absolutely no subjective symptoms save that he "couldn't see good."

Vision—O. D. 20/100,

O. S. 20/100 minus.

This could not be improved with lenses. The retinoscope showed approximately one degree of hyperopia. The fundus examination revealed a chronic passive congestion of the retinal vessels with a slight reddening of the disk. Careful inquiry into the family history together with a thorough examination of the patient effectually eliminated any specific or hereditary cause. The only possible causal factor that I could elicit I had finally to accept and I submit it to you. . . . When the patient was three years old he was taken to a show of some kind where he saw some acrobatic performances. He went home and soon learned to stand on his head and hang head downward by his knees or heels. He soon became so proficient that his mother assured me she very often would enter a room to find him standing on his head in a corner, and she had no idea as to how long he had been there. The same thing would happen in the yard except that he usually hung by his heels, out of doors. In fact the family had at length to forbid his antics for fear of possible evil results.

In the absence of other tangible causes I treated the case as an amblyopia from "position" and gave small doses of alteratives—for maternal mental effect, chiefly,—and strictly enjoined the indulgence in acrobatic tests. The first four months showed but slight improvement and, the patient moving away, I lost sight of the case, with a V. of 20/70 in each eye.

On Sept. 20th, 1909, the patient again consulted me,—this time for headache,—and I was delighted to find a vision of 20/15 in each eye, or exactly what the retinoscope had originally shown. Plus spheres alleviated this symptom. To conclude,—

I. We have an amblyopia from none of the common causes, starting when P. was still actively developing.

II. Improvement following indicated measures to overcome the passive congestion from position.

III. A final vision of 20/15, or the same as should be expected from the retinoscope, with headache relieved by proper lenses.

TREATMENT OF DACRYOCYSTITIS.

By G. Goldseth, B. S., M. D.,

JAMESTOWN, N. D.

Dacryocystitis divides itself, naturally, into the catarrhal and suppurative forms, each having an acute and chronic stage.

Catarrhal dacryocystitis in the acute stage is best treated by treating the rhinitis which is usually present. The eye should be treated with a few drops of adrenalin chloride 1-10.000 every four hours, by washing out the eye often with warm boric acid solution, and applying warm compresses.

As the disease assumes a chronic stage the lower punctum is dilated and the sac irrigated with a warm boric acid solution; but first it is well to introduce a few drops of adrenalin into the canaliculus. If this treatment does not prove sufficient, the probes should be resorted to, but only as the last resort, and preferably the bulbous pointed probes since these are not so likely to do damage as the other kind of probes. The leucodescent lamp 500 C. P. can also be used to great advantage.

Suppurative dacryocystitis in the early stage should be treated with cold compresses; but later on should be replaced with warm compresses. Constitutional as well as nasal treatment is of great importance. The pus should, if possible, be pressed out of the sac often and the eye washed out with (1-1000) solution of oxycyanide of mercury every four hours. But in spite of this treatment the disease may go on to abscess formation, which is drained by making an incision through the skin below the tendo-oculi behind the anterior lachrymal crest and parallel with it downward for a distance of one centimeter. The wound should be packed with small strip of iodoform gauze. In infants I have found that many cases will get well by simply probing the duct under general anaesthesia, and quite often only one probing is required.

Removal of the lachrymal sac should be done as soon as the inflammatory signs have disappeared. It should also be done in the non-suppurative form after syringing and probing has been faithfully tried without satisfactory results.

Local anaesthesia is the most convenient, but it can also

be done very readily under general anaesthesia. For local anaesthesia 20 minims of a 1 per cent. cocain solution to which has been added 3 drops of a (1-1000) adrenalin chloride is generally sufficient for the operation. It is well to use at least one-half of this when a general anaesthetic is used, since it lessens the amount of anaesthetic required and diminishes the bleeding. In old people it is better to use a smaller amount of the adrenalin. One-third of this solution is injected beneath the skin where the incision is to be made; one-third above the tendo-oculi, the needle being introduced just behind the anterior lachrymal crest so that it passes between the sac and the periosteum or between the periosteum and the bone, and the needle should be held parallel to the orbital wall; the remainder of the solution is injected under the tendo-oculi in a similar manner. I have found it advantageous to inject a few drops of a 1 per cent. solution of pyoctanin blue through the canaliculus or, if this is closed, through the skin into the sac; this stains it a dark blue and makes it nearly impossible to leave any of it behind.

The incision should commence ½ mm. above the tendo-oculi and 2-3 mm. to the inner side of the canthus should be about 1½ cmc. in length straight downwards in its upper half and curved slightly outward in the lower running parallel with the crest. It should be made with a sharp scalpel and the skin pressed against the bone with left thumb, but not stretched. After the incision has been made through the skin the edges are undermined and a Stevenson or a Mueller speculum introduced. The thin superficial fascia is now picked up with a forceps and transfixed with one blade of a curved iris scissors. The orbicularis muscle is slit open in the same way; and we now come to the deep fascia which is slip open 1 m. m. behind the anterior lachrymal crest. We must be careful not to open the sac at the same time and this can best be avoided by making very short snips at first until we are certain that the sac has not been transfixed. We next separate the canthal wall of the sac from the fascia with the closed scissors, beginning at the lower half and dissecting upwards and steady the sac by catching the edge of the deep fascia with the forceps. At the upper part we have the lachrymal ducts which must be cut with the scissors. We next separate the nasal side of the sac in a similar manner, but in this case we

begin at the top and dissect downward. We then dissect the sac downward to the beginning of the naso-lachrymal duct, which is done by holding the scissors parallel to the sac and making short cuts all around it. The upper part is left to the last, since it happens that some blood vessel is cut at this point, and as a consequence you may have a troublesome hemorrhage; but at this stage of the operation hemorrhage can give very little trouble. The apex is dissected by short cuts of the scissors around the sac, care should be taken that nothing is left behind. A probe is passed into the naso-lachrymal duct and its mucous membrane is carefully curretted.

The wound is closed by three skin sutures, the eye covered with a small pad of gauze and the wound covered with xeroform gauze and a pressure bandage applied, so as to obliterate the cavity. Should the surgeon suspect that all the sac has not been removed, then it is well to cauterize the puncta with the galvano cautery. The cornea should be inspected on the following day by pulling the bandage a little to the side, and the dressing should not be changed until the third day providing there is no complication. The stitches can be removed on the fifth day unless there is some complication which prevents primary union.

TRAUMATIC SUBCONJUNCTIVAL DISLOCATION OF CATARACTOUS LENS IN ITS CAPSULE.

By F. P. Maynard, F. R. C. S.

CALCUTTA.

A Hindu, male, aged 48, while working in the railway workshops, was struck on the left eye by a piece of iron which, he says, was "largish" in size. The sight in that eye had previously been poor. An hour later I saw him; I found the following state of affairs: In the right eye an immature cataract. In the left (the injured eye) the pupil was black and dilated, slightly irregular at its upper edge—due to a slight radiating laceration. The anterior chamber was deep. The iris was tremulous and there was a little blood on its anterior surface above and below the pupil. The lens was absent from its proper place. Vision=moving objects, and with a + 14 lens he saw figures at 15 inches. There was no wound anywhere.

On raising the upper lid, which looked at first sight as if there were a cholagion in its center, there was found to be a globular swelling under the conjunctiva a bit larger than a pea, which was the cause of the projection in the lid. This swelling was caused by the lens which had been dislocated into this position by the blow, and the swelling had a yellowish color owing to the brown lens (cataractous) showing through the semi-transparent conjunctiva. Under cocain an incision was made across the swelling parallel to the corneal margin and about 1/4 inch away from it. An overripe cataract *in its capsule* was taken out through the incision, which was then closed with two fine silk sutures. No vitreous escaped. Healing occurred quickly and the man left the hospital with good sight, there having been no other injury received by his eye.

The remarkable fact is the traumatic dislocation of the overripe cataractous lens in its unbroken capsule with so little other damage to the eye. The case resembles the historic one recorded by Fuchs, where a farmer was gored by a cow's horn first in one eye and years later in the other, with dislocation of the lenses and good resulting vision. There was an apparent regular cowboma of the iris in each eye in his case and no lenses were found when the case was examined.

ON THE PRESENCE OF NON-INFLAMMATORY EXUDATES IN THE AQUEOUS HUMOR.

(A Preliminary Report.)

By Burton Chance, M. D.,

PHILADELPHIA.

The presence of exudates, flocculent or precipitate, in the aqueous humor is, as a rule, indicative of serious disease of the uvea, and if the disease is not promptly relieved, it is commonly the case to find, accompanying these exudates, definite alterations in the structure of the various parts composing the uvea.

It is with some hesitation, therefore, that I venture to publicly describe certain unusual findings, the details of which have been gathered from the notes in the case-histories for the past fifteen years of my private practice.

In the routine examination of a goodly number of apparently healthy eyes, I have repeatedly noticed fine granules floating in the aqueous humor or resting on the capsule of the lens or in both positions. These granules resembled those such as one sees in cyclitis and could be studied best by the direct ophthalmoscopic view with a strong plus lens behind the sight-hole. They were of various sizes, ranging from the most minute to that of the medium sized ciliary granules noticed in cyclitis. They were suspended in the aqueous, and were never sufficiently numerous to be disposed in any definite manner as in the case of those seen in true inflammation of the ciliary body. Although these "exudates" were soon dissolved or absorbed, for they were not present the next day or two after the examinations, they were not confounded with the granular debris one sees frequently in the conjunctival secretion. They could not be washed away as one can cleanse the surface of the cornea in these other cases; a fact proving that they were within the eye rather than external and epithelial in position. Neither could they be taken to be transitory infiltrations of the cornea; nor could they have been blebs on the endothelial surface.

The persons examined did not directly complain of the presence of these bodies, though in several instances they were noticed in those who had been annoyed by muscae along with

their asthenopic symptoms. They were found chiefly in persons between twenty-five and sixty years of age; in those who had had the usual complaints accompanying asthenopia. In addition they were noticed in several much younger individuals with symptoms of blepharitis and in certain other with sluggish choroidal circulation without, however, any signs of distant disease of the uvea.

All the patients had been the victims of greater or lesser degrees of gastro-intestinal intoxication. One man a few days after examination was seized with appendicitis necessitating operative interference, and since his recovery there have been no exudates. In another, a vigorous man of full habit, they were seen repeatedly after indiscretions in diet. In the case of a young girl, a moderate myope, with an indulgent guardian, they were noticed several times; and in her case, they were black in color while in all others they were gray. In a routine examination of the patients in a large private hospital for the insane of both sexes, I saw them a number of times, especially among the melancholics.

In a number of cases the urine contained excessive quantities of indican and of other organic compounds, indicating deranged metabolic processes. Indeed, the presence of these granules in the aqueous has led me to make it a rule to send the urine to an expert for a qualitative analysis.

None of the eyes considered in this communication presented visible signs of past or active inflammation; neither did inflammation set-in in the weeks during which the patient remained under my observation. The granules were not discovered at the first examination of the patient, but they were distinctly visible, shining out against the full glare from the fundus, after the pupils had become dilated. In the cases now recalled, rapidly acting solutions of cocain with homatropin or scopolamin were used. The exudates were not seen in young robust children, nor in other persons for whom atropin had been prescribed; nor in those who may have used other cycloplegics several times for a day or so before presenting themselves again for refraction. It has been my constant practice to make an ophthalmoscopic examination of all persons consulting me, both after mydriasis as well as before cycloplegics are used; and it has been my endeavor to obtain mydriasis even in those of advanced years.

In the consideration of the presence of these precipitates certain questions suggest themselves: Can it be that these granules were coagulated particles of albumen transfused from the irida and ciliary vessels? Or were they migratory capillary cells; or were they degenerated leucocytes? Or, did the mydriatic and cycloplegic solutions cause a forcible rolling up of the iris and thus mechanically press upon the vessels and squeeze out their contents? The amount of this pressure from muscular action is not to be disregarded, for, witness the powerful exertion shown in the breaking up of iritic adhesions; and also the excessive pain in the muscular cramp produced when strong solutions of eserin have been instilled.

We all know that atropin and other allied drugs act upon the vasomotor system and tend to stiffen the bloodvessel walls. The sudden increase of intravascular pressure, thus produced, forcibly increases the activity of diapedesis and drives, presumably, thicker plasma through the walls of the vessels which thus, it may reasonably be conjectured, enters the aqueous chamber and is precipitated therein.

It is well known that the relief of ciliary spasm acts favorably upon congestion of the choroids and that a boggy chorioretinal sheet becomes smooth and tenser after a short course of the cycloplegics; and because of the relief of the venous stasis the aqueous accordingly can become rapidly purified. By this process, so I would infer, is it that the exudates I have here noticed, were so speedily dissolved and so soon disappeared.

And further, in certain physiological activities of the eye we have an opportunity to study processes analogous to those which go on in the kidney. The vascular folds of the ciliary corona transude their contents into the aqueous humor in much the same manner as the renal glomeruli transude their contents into the urine. And may one believe that in what I have here described as occurring in the aqueous, there has been a temporary albumenosis; or, that there has been an increase of the inorganic solids, just as we know that the phosphates or sulphates may be execreted in excess in the urine when atropin has been administered?

Again, another thought occurs to me, though it may be somewhat beside our subject, and yet pertinent to it. Can these renal processes be compared to the initial stage of the change which one sees clinically, taking place in the aqueous humor,

when atropin has been instilled into a "glaucomatous eye"? And if they can, do they not suggest that the derangement of the metabolic chemistry of the intestinal tract favors the augmentation of the intravascular tension through an increase of the solids of the blood, which in a given case may have tended to an increase of the solids in the aqueous humor, with the consequence of precipitating the onset of what we speak of as Glaucoma? In which state it is rare indeed not to find that disorders of the gastro-intestinal tract are a pronounced accompaniment.

MARGINAL RING ULCER OF THE CORNEA.

Report of a Case.

By Samuel Horton Brown, M. D.,

PHILADELPHIA.

Cases of this character not being of very frequent occurrence, the observations of any unusual features of the condition is taken to be of sufficient interest to warrant this report. The patient who was the subject of this affection was referred to me by Dr. Wm. D. Robinson of Philadelphia. He was sixty years of age and a lawyer by profession. He was rather thin and might be said to have appeared to be in poor health generally, and in addition to this was subject to undoubted muscular rheumatism which induced a stoop and affected locomotion generally. He was a citizen of an interior town in Pennsylvania.

The right eye was normal in every respect. Continued use of it during the course of the disease in the other in the presence of an optical defect, gave rise to some lacrimation and conjunctival irritation which was subsequently relieved by prescribing proper glasses. The vision without glasses was 5/xxx and was brought to 5/v with the appropriate correction.

The left eye was the site of the ulcer. Four weeks previous to his first visit to me he had experienced some pain and distress in this eye and consulted a physician in his home town, who informed him he had "granulated eyelids" in both eyes and prescribed a lotion and an ointment for this condition. He continued this treatment for an indefinite length of time, but at the end of the first week he suffered from most excruciating pain in the left eye and over the left temple and brow. This persisted with short intervals of relief for about two weeks when it gradually began to subside. One week later the patient consulted me.

Upon examination the eyelids and lacrimal apparatus were found to be normal; chronic catarrhal conjunctivitis was present; pericorneal injection was marked; almost the entire outer half of the cornea was white, but this had not been previously noted by the patient or his physician or his friends; about one or two millimeters from the corneal margin, separated from it by clear cornea and running parallel to it for half of its course

was a crescentic groove in the cornea, at either extremity of which were evidences of active ulceration. The pupil was contracted and bound down by posterior synechiae, but there was no history of previous inflammation. The opacity of the cornea prevented ophthalmoscopic examination of the fundus. The patient could count fingers at six inches.

The appearance of the ulcer suggested epithelioma of the cornea, but the additional observation of Dr. Frank Fisher of Philadelphia corroborated the original opinion that it was ulcus serpens of marginal type. It was thought well to determine the bacteriologic aspect of this case with a view of resorting to vaccine or toxine treatment, but cultures made by Dr. B. A. Thomas proved negative and this course was abandoned. The treatment consisted in the use of boric acid solution, atropin and iodoform ointment, and a protecting bandage with slight pressure. The extremities of the ulcer were cauterized with carbolic acid. After about two weeks of this treatment the patient was permitted to return home, but instructed to continue the measures already mentioned. He returned in a week with a muco-purulent discharge in the left eye, which was soon controlled bythe judicious use of a ten per cent. solution of protargol.

The crescentic groove began to fill up and the central part of the cornea no longer seemed to protrude. The iodoform was discontinued. A five per cent. dionin solution was instilled daily for a week and gradually the pericorneal vessels extended over the site of the ulcer. Atropin was then used sparingly and the bandage continued. The dionin would be withheld for four or five days and then used again. Tonics, antirheumatic remedies, and vapor baths were also administered. The local treatment was slowly withdrawn altogether with the exception of the dionin solution.

Three months after his first visit the cornea of the left eye was entirely free from ulceration, and there was no conjunctivitis. The cornea was nebulous for its outer half, but there was no staphyloma. The patient had only light perception in this eye at the time of discharge.

The striking features of this case are the marked resemblance clinically to epithelioma of the rodent ulcer type, which possibility was eliminated by the subsequent course of the condition, the entire absence of any pathogenic bacteria, especially the pneumococcus, and the presence of marked rheumatism.

A CASE OF ULCEROUS SCLERITIS.

By Dr. Henning Rönne,

COPENHAGEN, DENMARK.

In most text-books is told as one of the marks characterizing the scleritis nodes that they do not ulcerate.

It also belongs to the most uncommon things in literature to find descriptions of ulcerous scleritis, mind not ulcera sclerae, which is communicated in rather great number, but typical, recidivating, nodular, rheumatical scleritis and episcleritis with formation of ulceration. I have only found such a case mentioned by *Hirschberg* from 1874, and I have myself, in *Klinische Monatsblätter für Augenheilkunde,* Mar., '08, communicated a similar case. However such cases are perhaps not so rare as one should think from the scarce casuistry, at any rate I have seen one case more, whose history I am going to communicate:

H. M., aged 35, m. t., a shoemaker. One of her sisters died of tuberculosis, otherwise no sickly dispositions whatever. In March, 1909, the present disease commenced by scleral injection; a yellow spot formed in the injected part.

17/16/08, she met for the first time at the clinic, where a right-sided scleritis was stated. She was treated with aspirin, cocain and atropin as well as with massage, and shortly after she went home unrecovered but much better.

27/7. She came back, as she had again got periorbital pains in her right eye. The state was: The pupil maximally dilated (atropin); however a few string-formed synechiae downward, outward rest. Straight upward is seen at the upper corneal margin a rather extended episcleral infiltration of 15 mm. extension in breadth, 12 in height. In the infiltration appear some yellowish nodes, 4 laterally lying, deep and with conjunctiva able to move on it, besides 2 nasal nodes which are adherent to conjunctiva and distinctly superficially ulcerated. At the bottom the ulcertation is filled with a yellowish necrosis-like mass. The bottom is distinctly getting a greenish yellow color by fluoresceinkalium. The ulcerations are quite superficial not craterformed. Cornea is in the neighboring part slightly diffusely parenchymatous, dim without vessels.

No visible opacities in the ep. vitreum, but the back of the eye is seen slightly veiled, what is scarcely sufficiently explained by the dimness of cornea nor by the numerous pigment deposits on the front lens-capsule. Visus, o. dx. 5/xxiv.

On the left eye is seen probably as an accidental discovery a peripherical isolated atrophy of the chorioidea as well as a fixed veilformed opacity in the ep. vitrium, which stretches towards the atrophical spot.

1/8. Subjectively little improvement. Injection and swelling somewhat abated. Pupil well dilated. On cornea several pointformed opacities, which at any rate partly consist of precipitates on the mbr. Descemmettii; one cannot decide whether some of the points are lying in the deep tissue of the cornea or not. The ulceration are now deep and craterformed, what is first to be stated by means of sounding; as they are quite small (½ mm. in diameter) and filled with a liquid, they appear on cursory view somewhat flatter. A third of the nodes are now ulcerated and with a whitish tatter at the bottom of the ulceration.

3/8. Today is made excision of a not ulcerated, well limited node.

8/8. The three ulcerations are now epithelium-covered.

28/8. The few scleritis-nodes are now healed and a slate-colored scar is appearing, but on both sides are formed new scleritis-nodes near cornea. The patient could not wait for her recovery of this new recidivation, but was obliged to go home and be attended to by her family physician.

Microscopical Examination of the Removed Piece of Tissue.

The proper mucosa showed in all cuts distinct symptoms of inflammation in the form of intense dilatation of the vessels and distinct subepithelial and perivascular cell-increase consisting of lymphocyts and a few plasmacells.

Under the mucous membrane was found in the subconjunctival tissue a dense heap of cells sharply limited against the conjunctivae, evidently the episcleral node. Here, too, were found besides the fix cells of the tissue a mixed heap of lymphocyts and plasma cells without grouping and without a pronounced perivascular formation. No bleeding; but on a single spot a distinct irregular necrosis was lying superficially in the node out against the conjunctiva.

Here was found partly distinct fragmentation of the nucleus,

partly these had an irregular form; pointed pear-shaped or sand-glass-shaped, and pronounced more scarce than in the rest of the episcleral node. Necrosis was on the circumference limited by a distinct reaction being seen a many-doubled row of long fibroblasts, all arranged right-angled of the surface of necrosis, by which means they formed a characteristic border round this.

Nowhere were found any symptoms of tuberculosis.

Hirschberg's case as well as my two cases were typical, recidivating sclerits probably of rheumatical origin, and nothing whatever showed one from the ordinary sclerits differing etiology. In my cases there was, at any rate, no question about tuberculosis, what in my first case was evident from the bilaterality, from the pronounced tendency to healing of the ulceration, from the fact that the recidivations did not appear in loco but as the ordinary scleritis in a circle around the cornea a few mm. from this and leaving slate-colored scars, from the fact that the microscopical examination gave no holds for tuberculosis, that the bacilli could not be pointed out though 78 cuts were examined, as also from the fact that a triple implantation in the camera anterior of a rabbit gave a negative result. From similar reasons tuberculosis is also improbable in my here-communicated case, and I think I can take for granted that all the heremention three cases have been rheumatical scleritis of ordinary etiology, what is further founded on the fact that in both my cases there was observed scleritis nodes of ordinary appearance as not ulcerated, but were resorbed as is usual in this disease, as well as the ordinary result of the scleritis, the slate-colored scars developed. Even if the casuistry as to the disposition of ulceration is so scarce, the literature on the pathological anatomy of the scleritis contains, however, a few holds which make possible to understand that the ulcerations can appear. Though only a few pathological, anatomical examinations of scleritis are forthcoming, we see it comparatively frequently mentioned that the authors have found more or less pronounced degeneration of cells in sclera even on necrotic spots, thus as I, too, have found in the above reported case.

Uhthoff writes that he has observed "fragmentation and chromatolysis, bad coloring and great degeneration of the nucleus, but certainly no real necrosis."

On the contrary, *Schlodtmann* found in his *"Sulzige In-*

filtration der Sklera" numerous limited necroses, which found a circle round "bulbus," and *Friedland* found even, besides some necrotic parts in sclera, a whole sequestration of a part of scleral lamels in the depth of sclera.

It is, therefore, an obvious conclusion that the characteristic picture of ulcerous scleritis rises at a special size and situation of the, under ordinary circumstances, likely rather frequent necrosis, where these not as usually resorb and leave the well-known slate-colored spot, but are removed by expulsion through conjunctiva bulbi.

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ELECTROLYSIS IN THE TREATMENT OF INDOLENT ULCERS AND FISTULAE OF THE CORNEA.

By F. Cornwall, M. D.

SAN FRANCISCO, CAL.

Recently, reference has been made frequently in journals of ophthalmology to the employment of the galvano-cautery in the cure of ulcers of the cornea. Dr. Martinasche, a San Franciscan, first employed and published this process. I have noticed a writer giving some European credit for originating this method, but consultation of files of the *Archives of Ophthalmology* about twenty-five years ago will establish it to have been an American.

It was this that suggested to me the electrolysis, as being preferable. As many as ten years ago, I wrote in the *Annals of Ophthalmology* on the superiority of electrolysis to that of galvano-cautery in indolent and particularly in central ulcers of the cornea. It was claimed that while it would accomplish all that galvano-cautery would, by way of cure, it was to be preferred for the reason of the lesser destruction of normal tissue by the electrolysis.

In the last fifteen years, I have treated all my cases of corneal ulcer, excepting phyctenular, by this method and have been gratified in almost every one. This has often taken place subsequent to the skillful administration of the standard forms of treatment. My record was destroyed in the fire and so am unable to report many cases. I have also treated a few cases of corneal fistula by the electrolytic needle and was successful when the opening was near the corneal periphery. This was done by bending the needle about two millimeters from the point at right angle to its shaft and with it erode the anterior surface of the iris and the posterior surface of the cornea to induce adhesion, and also to irritate the walls of the fistula. In this way the iris was made to plug the post entrance of the fistula till scar tissue would fill the canal. I treated a case many years ago, that would answer to the above description and report of which has been noted in periodicals and text-books. Ten years after the operation, the cicatrix gave way, forming an ectasia. Several electrolysis operations failed to

re-establish the cure until an iridectomy was performed, since which time the bulging of the scar has ceased.

Reverting to Indolent Ulcers of the Cornea.

Apprehending there are those whose experience with electrolysis has been meagre, some instruction as to the technique should be given. The needle to be used may be selected at the electrical store from those employed by the "face doctor" who depilates the faces of women who grow undesirable hirsutes. Inasmuch as this work should be done under the magnification of a convex lens as strong as 16 D., a very fine pointed needle is best employed. The dispersion electrode—the positive pole—may be placed on the face of the patient. The operator is to secure the most favorable illumination and with the aid of his glass be able to view every aspect of the wall and base of the ulcers. The assistant now is to move the current controller to a point experience has shown to be about right. The needle ought to register about half a milliampere. And now the operator may touch the different parts thought desirable with the point of the needle.

A moderate development of air cells should form. If this effervescence is too active it would indicate the current is too strong and if little or none, the current too weak. Of course the part has been anesthesized by cocain. It is impracticable in this procedure to rely on the ammeter, as the indicating needle of the instrument will be kept moving back and forth by the intermittent touching, so that no knowledge of current strength can be told. I would suggest that anyone beginning this method should practice with it on some part not so important as the eye. In this case the "hair puller" could demonstrate, quickly, all you need to know. I will report a case:

Dr. H., an old friend of mine, whose place of business was in the country, had an attack of central ulceration of the cornea of left eye. He consulted and was treated for two weeks by a near by oculist. At this time I made my first examination. The ulceration was superficial, involving the epithelium only, but extended over nearly a fourth of the area of the cornea. The persistence of the disease and the fact that it could not be traced to a traumatism or to any extraneous cause influenced me to suspect some constitutional cause, and so referred my friend to an eminent diagnostician who, after a painstaking

examination pronounced him free of such conditions. He (the diagnostician), not knowing of my connection with the case, called in another oculist, who treated his eye according to what is classed by modern authorities as the best way to manage such cases. At the end of two weeks the eye had become so much worse as to alarm the patient and he again applied to me. Knowing I would refuse to treat his case, except by consultation, he deceived me, telling me no one was treating him.

One application with the electrolytic needle cured the case in three or four days.

A NOTE ON ANTERIOR CHAMBER IRRIGATION AFTER CATARACT EXTRACTION.

By Edwin Temple Smith, M. B., M. R. C. S., Eng.,

QUEENSLAND, AUSTRALIA.

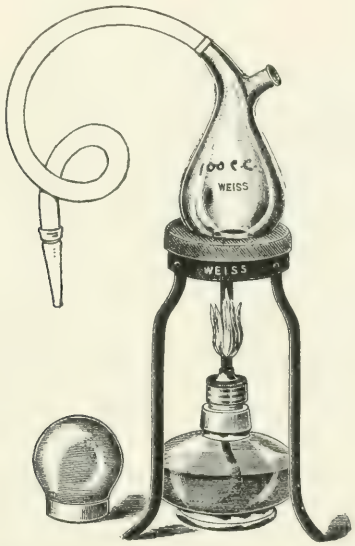
I am unaware what place this procedure has, in connection with the removal of troublesome cortex, in the routine practice of oculists at the present time. In Professor Priestley Smith's clinic, 13 years ago, it was to my own knowledge entirely unused. Most text-books merely mention it as a supplementary method of dealing with residual cortex, introduced by McKeown of Belfast. I should gather from reading that it is used more or less as a matter of routine in India, and that it is coming more generally into use elsewhere.

To a practitioner who has had no opportunity of seeing it done, however, the account given in Herbert's able monograph on *Cataract Extraction,* with its elaborate technique and apparent need for trained assistance, would quite suffice to prevent his attempting it. Maynard, in his excellent work, *"Ophthalmic Operations,"* gives a good description, but here, too, the procedure and apparatus are complicated and elaborate.

Although the chief value of irrigation lies in the power that it gives us of dealing with not fully mature cataracts, yet it is often of great assistance when least expected. The need for something of the kind was brought forcibly home to me some time ago when operating on an old lady of 80, with what I believed to be a hyper-mature cataract. Anticipating a large nucleus, an extra large incision was made. But, even so, caused partly by a spasmodic contraction of the *sphincter iridis,* much cortex was brushed off. Being averse from leaving much behind in so old a patient, nearly an hour was spent with currette before the result was deemed satisfactory.

It was just after this that I read Mr. Bishop Harman's paper in the *Ophthalmic Review* of November, 1909, in which he described so simple an apparatus that irrigation comes within the reach of anyone, whatever his disadvantages as regards environment and assistance. As well as in hospital, I have used it in a cottage kitchen and on the open verandah, with only an unskilled relative of the patient to assist.

Mr. Harman suggests as the reservoir a 100 c. c. glass "undine" flask, as used at Moorfields (see Fig.). The snout can be readily broken off by marking it with a file. I obtain the flasks from my instrument dealer in Brisbane at 10d. each. The nozzle I use is McKeown's plain silver one, with a slot in the end like a shark's mouth, though doubtless any similar one would do. This is connected with the flask by 8 inches



of baby's bottle tubing. Borroughs, Wellcome & Co. supply soloids of sodium chloride, 4 of which to 100 c. c. (3½ oz.) make normal saline solution. The flask, which, with nozzle and tubing, has been previously boiled, is filled through a thistle-funnel, and can be heated to boiling point over a spirit-lamp stand, on which is placed a brass wire-gauze plate. Usually, however, I prepare a pint of normal saline in an ordinary chemical flask. I pour a pint of already filtered water through a filter-paper into the flask, add two soloids, and boil, sealing the flask with cotton wool. This I take in my bag to the operation, and the quantity suf-

tices for general irrigation of the eye in the way of preparation. Biniodide or boracic acid of course can be added to a portion of it if desired.

For the intra-ocular irrigation, I fill the sterilized 100 c. c. undine with the saline solution, and warm it over the lamp till a clinical thermometer registers about 100 degrees. Then by the time one is ready it is at blood heat.

An assistant, any person of ordinary intelligence, holds it, tipped up so that the solution flows in a steady stream, and one controls the flow with finger and thumb on the tubing close to the nozzle. The short length of rubber tubing prevents the flask being raised to an undue height. No syphon action has to be started, with, in a hot climate, the attendant trouble of perishing rubber.

I have used this method many times since reading Mr. Harman's paper and can see no added risk of trauma or sepsis. When, through an incision too small in proportion to the size of the nucleus, or from immaturity of the cataract, much cortex remains behind, one is tempted to greatly prolong the operation while coaxing it out; or, worse still, to use over-instrumentation. The eye is subjected to much less trauma and is exposed for a less time by washing out the cortex. As for the element of sepsis, I fail to see why, with so readily sterilized an apparatus and solution, this should not be quite easily eliminated.

It is pleasing to see the flocculent cortex driven out like a flock of sheep by the circulating fluid, and the clear, black pupil which is left. And I have been impressed by the uneventful convalescence which has ensued in every case in which irrigation has been adopted. The lymph-like appearance of the pupillary area on the day after irrigation, mentioned by Maynard, is a very constant phenomenon, but always clears up in a few days.

I will conclude in the words of Mr. Bishop Harman, to whom, as a country practitioner, I feel greatly indebted for bringing within one's reach what was before a too elaborate process: "The beauty of McKeown's irrigation is such that I am sure it must appeal to every surgeon who sees it used, or tries it for himself."

RUPTURE OF THE CHORIOID.

Report of a Case.

By George F. Keiper, A. M., M. D.

La Fayette, Indiana.

While rupture of the chorioid coat of the eyeball is not so rare, yet any new case possesses sufficient interest to warrant more

than a passing notice. Rupture of this membrane is usually crescentic and is characterized by the retinal vessels passing over the tear without interruption in their course.

The case herewith reported shows in addition to the usual

picture a heaping up of the chorioidal pigment around the edges of the tear with both extending into the macular region.

Albert D., aged 21, of Pine Village, this state, presented himself at my office August 25th, 1909, with the following history: Last March, while playing ball, he was struck in the left eye by a ball and forthwith was blinded in that eye. He says that he consulted a physician, who told him that his optic nerve was affected. Not recovering vision to any extent, he came to see the writer as above.

Examination shows all external structures of both eyes normal. The pupil of the left eye was dilated to a diameter of six mm. That of the right eye was normal. The field of the left eye was normal as to its periphery, but showed characteristic scotoma corresponding to the affected area. The ophthalmoscope showed the condition as depicted in the drawing of the fundus accompanying the article. With the indirect method, the tear is seen running in a curved line from a position about one disc diameter below the optic nerve head, curving around the disc upward and outward until it ends in a position two disc diameters distant from the optic nerve head. From its center runs another tear towards the macula and involving it. The peculiar feature about the case is the heaping up of the pigment of the chorioid around the edges of the tear. The retinal vessels pass over the lesion without interruption.

The vision of the eye is 20/CC, while that of the other eye is 20/XV. He is confident that the vision of the injured eye was the same as that of the good eye before the injury. Of course the prognosis for increase of vision is very poor.

A CASE OF SPASM OF THE RETINAL ARTERIES.*

By Henry Dickson Bruns, M. D.

NEW ORLEANS, LA.

History.—On April 15, 1908, H. B. came to the Eye Department of the Eye, Ear, Nose, and Throat Hospital, complaining that vision had been failing for two weeks. She had had no important illness except a convulsion about three weeks ago. The girl was rather tall for her age, slim, sandy haired, a little pale, with delicate, freckled skin and blue eyes. Nothing abnormal was observed about the eyes, *facies* or figure on simple inspection. The vision in R. E. was finger counting at four feet, in the L. E. at 15 feet. The pupils were dilated with homatropin, and the ophthalmoscope showed the arteries extremely small, the veins enlarged and dark, in some places almost chocolate colored. Besides their notable pallor, there was about the discs a bluish-white halo (edema) extending for at least one diameter over the retina all around. Pressure upon the eyeballs produced strong pulsations, and finally almost total exsanguination of the retina. The appearance resembled embolism of the central artery, for which, had it been monocular, it might have been mistaken. To encourage the patient, and not to interfere with the natural course of the disease, 1/120 grain of strychnin sulphate, to be taken twice a day in a little water, was prescribed. In a day or two we sent the patient to Dr. E. M. Dupaquier, our colleague of the chair of Clinical Therapeutics in the Polyclinic. After an examination he wrote that he could elicit nothing of *interest* except that the girl flushed easily and that, under the fire of the examination, he noted little choreiform movements. She came of a neurotic family; her sister often had attacks of hysteria major (?) and the patient herself had had other convulsions at two years of age. He was inclined to believe that the sudden interruption of the circulation in the optic nerves and retina owned a nervous origin. "Dan ces cas de névroses sans lésions," to quote from his report, "ces phénoménes sont transitoires et parraissent due communément á une intoxication alimentaire, sans,

*Read before the American Ophthalmological Society, Washington, D. C., May, 1910.

arterio- sclérose marquée—Ils guérissent." Upon the patient's second visit the diagnosis of spasm of the retinal arteries was made. At this visit, April 24, V = R. E., fingers at two feet; L. E. 20/lxx.

April 27, 1908: V = R. E., fingers at four feet; L. E., 20/xxx. In the left eye, the edema in and about the papilla had diminished, and the disc showed an excavation and a pallor of the portion corresponding to the papillomacular bundle. This was in twelve days without treatment. The patient was seen again on May 4, 13, and 27, June 17, and July 22 without anything but steady gradual improvement being noted. July 29, V, R. E. = 20/xl; L. E. = 20/xx. In the left eye the ophthalmoscope showed nothing that could be called abnormal, but there was a central physiologic excavation of the disc. In the right eye there was indubitably pallor of the whole disc. The excavation looked much larger than in the fellow eye, and the lamina was too distinct. I thought this right nerve slightly atrophic. Again the patient came on August 25, September 30, and October 30, but again nothing was noted but slow steady improvement in vision, until November 20, 1908, when V = R. E., 20/xxx; L. E., 20/xv. The ophthalmoscope showed "convolvulus disc" in each eye.

During this whole time the fields of vision had been carefully taken. On April 24 the field of the left eye, with V = 20/lxx, was quite normal. It was impossible to take a field of the right eye, but the candle-flame field seemed to be somewhat contracted. By June 17, V being R. E., 20/lxx, and L. E., 20/xv, both fields were normal. On January 20, 1909, when V was R. E., 20/xxx; L. E., 20/xx, our note reads: Fields are perfectly normal and color perception for red and green good in all parts of the fields. At no time were the fields suggestive of hysteria.

On March 30, 1909, nearly a year after her first visit, the patient came again. Dr. Joseph Weis had been appointed visiting internist to the hospital, and Dr. E. M. Hummel, visiting neurologist, and I sent the patient to consult both. The neurologist reported on April 4: Examination negative. No stigmata of hysteria; the history, however, is somewhat suggestive of this condition. The internist kindly furnished the following notes: April 7: A white school girl, born in New Orleans fourteen years ago; mother, German; father, Spanish.

A year ago had a convulsion followed by disturbed vision. Return headache every month. No menstruation. Sister had hysterics with first menstruation. Has had measles (?); previous history otherwise negative. Good appetite. No night urination. Weight, 70 pounds six months ago; improved since. No color—always pale, but flushes. Hemoglobin, 70 per cent. Urinalysis, albumin, slight trace, sp. gr., 1010. The sediment was not examined at this time, but subsequent examinations discovered no casts or anything noteworthy. April 28, doing well. Urine shows a slight trace of albumin, sp. gr., 1002. Urine shows effects of too much water; pulse also; tension high. Advise less fluid. May 5, doing well. Urine, slight trace of albumin, sp. gr., 1008. Pulse, high tension. In August, Dr. Weis being absent, Dr. C. L. Eshleman, who filled his place, noted albumin still present. Pulse, high tension. Feeling well, however. On August 26: Looks much better, and feels better. Urine shows about 1 per cent. of albumin. Pulse, low tension and generally seems to be doing well. Previous examination showed only a trace of albumin.

September 30, 1909, urine negative; pulse still shows tension; occasional headaches. No medicine now. Simply dietetics and attention to excretions.

On December 3, 1909, almost twenty months after her first visit, Dr. Weis and I saw the patient again for the first time in several months. Her general appearance was much improved. She had menstruated for the first time on November 18 just past; urine acid; no albumin, no casts, sp. gr., 1015. Hemoglobin, 80 per cent. Tension of vessels seems less. Reflexes slightly exaggerated. V = R. E. and L. E., 20/xv for the first time.

Literature.—Such reading as I have been able to do indicates that the condition is rare. Though mentioned in our texts, the literature is widely scattered through many periodicals, almost entirely unavailable to me. However, enough has been quoted, I hope, to serve as the basis of my argument.

Soelberg Wells (*Diseases of the Eye*, edited by Bull, 1883), under the heading Epilepsy of the Retina (*Ophthalmic Migraine, B.*, p. 539), quotes Hughlings Jackson's observation during epileptic unconsciousness with dilated pupils. "Once the vessels disappeared. After a while, however, they reappeared, and were found to vary with the respiration. When the patient

inspired, the vessels disappeared, returning again on expiration, like lines of red ink on white paper." This, Wells thought, was "dependent in all probability upon a contraction of the retinal vessels," but nothing like it took place in my case, or, as far as I know, in any of the best established cases. It would seem more likely to have been a phenomenon of extreme ischemia, in which the empty vessels refilled upon expiration, than a spasm synchronous with inhalation.

Under the title of Spasm of the Retinal Arteries, Megrims, Epilepsy of the Retina, Noyes (*Diseases of the Eye,* 1890) says: In consequence of vasomotor irritation, the retinal arteries may be firmly contracted and arrest completely the circulation, and he cites these cases:

Mrs. W., widow, forty-three years of age, was brought to me by Dr. Burchard. She seems well nourished, but is said to have lately lost flesh. Has an anxious expression; been greatly worried by business cares, and been under much excitement. Three months ago she began to have obscuration of sight in the right eye. In a little time the sight would go out, as she said, every twenty-four hours, and everything be dark for fifteen to thirty minutes. This condition affected the right eye only until a few evenings since. Then, while at the opera, she became totally blind for about one-half hour, and, as she says, was in total darkness. Since then the same thing has happened every evening, and lasted from a few minutes to a half-hour. At my interview with her in my office she exclaimed that sight was leaving the left eye. Her vision had been previously examined and found to be 20/xx in each eye. While the dimness existed, I inspected the left eye with the ophthalmoscope. The arteries were reduced in size; the veins were normal; no other notable appearances. The attack passed in a few minutes, and then the arteries grew larger and more like those of the other eye. There were no signs of effusion or inflammation. My advice was to use bromid of ammonium, to take nourishing food, and to try to secure exemption from anxiety and care.

In another instance, in a man, the blindness was complete in both eyes for sixteen hours and then perception of light began to return. I saw the man twenty-four hours after the beginning of the attack, and by the opthalmoscope recognized great pallor of the optic nerve, tenuity of the arteries, the veins

about normal. No effusion or swelling of the nerve or retina; tension normal; pupils active. Could count fingers at six feet. By inhalation of nitrite of amyl, vision was retored in twenty minutes to the normal degree and the intra-ocular circulation was resumed.

Dr. de Schweinitz, writing of embolism of the central artery of the retina (*Diseases of the Eye,* 1906, p. 573), says: "The ophthalmoscope picture just detailed indicates that there has been an interruption in the arterial circulation, but does not prove that stoppage has been due to embolism. Similar appearances occur, . . . according to A. Hugh Thompson, with spasm of the muscular walls of the central artery . . . . Some cases appear to be due to collapse of the arterial walls, so that they come in contact (Hoppe). Cases of this character may recover spontaneously or yield to treatment."

In *Wilbrand and Saenger,* 1909, vol. iv, p. 137, we find, under Spasm of the Retinal Arteries:*

A. In Migraine.—Parisotti (Ann. del ocul., t. cxix, p. 321) had the opportunity, in a case of ophthalmic migraine, to examine ophthalmoscopically. The lower half of the field was gone; the arteries of the upper half of the retina were narrowed; those of the lower half, normal. After the disappearance of the hemianopsia the arterial spasm was gone.

Quaglino (Ann. de ocul., t. lxv, p. 129): A thirty-four-year-old teacher, who, as a child, suffered from scrofulous keratitis and later from asthenopia, had attacks of "Flimmerscotom," especially if the meal-times were unduly postponed. The attack lasted from five to fifteen minutes, with transitory blindness, during which elliptic light figures with brighter rays were seen above. During the attacks the retinal arteries were narrowed.

In Siegrist's cases of hemicrania (*Mittheil. aus Kliniken der S.,* Reihe, Heft 10, 1894) the eye-grounds were twice examined and the retinal arteries on the side of the pain were markedly contracted.

B. Helminthiasis.—Faravelli (Ann. di Ottal., xvi, p. 63, 1887) reports the case of a baker, thirty years old, who, while at work, was attacked with violent photopsia, followed by veiling of the sight of the right eye. Throughout a week the phenom-

*I am indebted to Dr. H. Hansell, of Philadelphia, for the abstract.

enon was repeated each night two or three times; then a rest o a few months was followed by a more violent recurrence. The dimness increased to momentary blindness of the right eye, with lesser obscuration of the left, passing off completely in ten minutes. The ophthalmoscope showed anemia of the retinal arteries and congested and pulsating veins, the appearances being more marked on the right side. During the intervals between attacks the vision was normal. After a tapeworm, without the head, had been evacuated, the patient was free from attacks for two months, but with the reappearance of segments of the worm the eye symptoms recurred. The head having been expelled, the patient remained well.

C. Unknown Etiology.—Alexander reports (Deut. med. Woch., 1881, No. 40, 41) the case of a nineteen-year-old girl who complained for eight days of increasing dimness of vision R. E. = 18/200). There was concentric narrowing of the field, but the color perception was normal. The pupils were sluggish; eye-grounds normal. The diagnosis of retrobulbar neuritis was made. After fourteen days vision had sunk to 3/200. All the retinal vessels were now found to be much narrower, the arteries hair-like, and hard to differentiate from the veins. Arterial pulsation could be produced by slight pressure. The macula was intact. The conclusion was reached that the case was not one of embolus, but, on the contrary, one of vasomotor cramp of the vessel-walls, and amyl nitrite was given. In four months all the phenomena had disappeared and vision was normal.

Reynard (Arch. Gén. de Med., January and February, 1874) claims to have seen cramp of a part of the retinal vessels, manifested by contraction of the vessels in small isolated sections; but Panas denies the correctness of the observation.

After Contusion.—Hirschberg (Berlin. klin. Woch., 1894, B. 22), Pearse (Albany Med. Annals), June, 1901, and Bäck (Arch. f. Ophthal., xlviii, 1).

E. After Infection.—Two cases of Ramorino (Ann. di. Optal., vi, 1, p. 25) of spasm of the retinal vessels in malaria. The principal symptoms were periodic amblyopia, with, during the attack, white papillae, thread-like, almost bloodless, arteries, and scarcely perceptible veins. Cure by quinin.

F. After Intoxication.—With antifebrin: Hilbert (*Mem-*

orabilien, Heft 2, p. 5, 1895); with bromid of potassium: Rübel (Centralbl. f. Augenheilk., October, 1884); with quinin, large number of cases; with lead, chronic poisoning.

G. Arteriosclerosis.—Wagemann (Arch. f. Ophth., xliv, p. 219).

In the above cases the cramp affected all the branches of the central artery, but a spasm in the form of a ring-like advancing peristaltic contraction is said to have been observed also with the ophthalmoscope. Reiner (Arch. f. Aug., xxxviii, p. 25) says that this worm-like contraction, earlier described by Liebreich, may be an incorrect interpretation of an ophthalmoscopic appearance due to a granule-containing blood-stream —like sand and water—flowing through the veins.

In a paper on obstructions in the retinal arteries, read before the Ophthalmic Section of the American Medical Association at the meeting in June, 1904 (Jour. Amer. Med. Assoc., March 11, 1905), Dr. Allen Greenwood considers obstruction due to arteriosclerosis, to embolism, and to spasm, and gives a number of valuable references. Of spasm he writes: That spasm of the retinal arteries may occur, of sufficient degree to cause a temporary partial or complete obstruction to the flow of blood, seems proved beyond a doubt. It has been the good fortune of several observers to see patients during an attack of spasm of the retinal vessels, where, for a few moments, the arteries were reduced to yellow streaks, with subsequent restoration of the circulation. Such patients give a history of more or less frequent attacks of complete or partial blindness of one eye, lasting from several minutes to an hour or two. Case III described above gives such a history, and there were evidently attacks of spasm preceding the final complete obliteration of the inferior temporal artery. It is my belief that spasm occurs most frequently in early stages of arteriosclerosis, and should be looked upon as a warning of future obliterating arteritis. Wagemann's* classic and frequently observed case of repeated spasm finally had a spasm that was not relieved, and, the arteries remaining closed, the picture of embolus was produced. I doubt if more than very temporary spasm occurs in healthy vessels with normal blood, but that patients with retinal arteriosclerosis complicated by recurrent attacks of spasm are in special danger

*Dr. Greenwood refers to Trans. Heidelberg Ophth. Soc., 1897.

of blindness is evident. Virchow, many years ago, pointed out the fact that the arterial walls would close around an embolus, thus making an obstruction more complete. This contraction or spasm was only temporary, and it is only rational to expect that it would be a frequent and a recurrent accompaniment of endarteritis. Zehender was the first, according to Ole Bull, to call attention to arterial spasm, and in 1866 he published a case of repeated spasm of the retinal arteries following the repeated use of an ice-bag.

Ischemia of the Retina.—"Those rare cases in which ischemia occurs as a more or less independent affection" is the condition described by competent observers, which most closely resembles that which others equally trustworthy have satisfied themselves is due to spasm of the central arteries. Soelberg Wells, under the heading Ischemia of the Retina, after recounting the symptoms and referring to the cases of Alfred von Graefe (Arch. f. Ophth., viii, 1, 143), Rothmund (Klin. Monatsbl., 1866, p. 106), and Heddäus (*ibid.*, 1865, p. 285), says:

"In von Graefe's case the patient, a little girl, five and a half years of age, suddenly overnight became totally blind in both eyes, so that not the faintest perception of light remained. On examination the eyes presented the following appearance: The tension of the eyes normal, conjunctivae very pale, the eyeballs of marble whiteness, pupils much dilated, without any reaction on the stimulus of light, but a faint uniform contraction on the application of laudanum; only slight increase in dilatation on the application of atropin. With the ophthalmoscope the dioptric media were found transparent, the retinal arteries extremely attenuated, the veins tortuous and dilated. The retina and optic nerve were normal, the outline of the latter being, however, slightly indistinct. The color of the skin, but especially of the mucous membranes, was extremely pale. The child was otherwise perfectly well, the only peculiar symptom being extreme rapidity of the pulse, which was very small and numbered 160 beats to the minute. Von Graefe considered that the probable cause of the blindness was an insufficient supply of blood to the retina, the faint and rapid contractions of the heart not being sufficient to overcome the normal, but proportionately too considerable, intra-ocular tension; he, therefore, gave the name of 'ischemia retinae' to this affection. The correctness of this view of the cause is strengthened by the

fact that, after all other remedies, such as mercury, suppurating blisters behind the ears, artificial leeches to the temples, etc., had failed, an iridectomy, made upon the right eye ten days after the complete loss of sight, proved successful.

"Rothmund mentions two similar cases of ischemia of the retina in which paracentesis proved effectual, having, however, to be repeated in the second case."

Noyes (*loc. cit.*, p. 548) writes: "In a case which I saw in consultation with Dr. Knapp (Arch. of Ophth. and Otology, iv, p. 448, 1875) the child, three years of age, had been much prostrated by whooping-cough, and when convalescing, suddenly became totally blind, losing perception of light in both eyes. The optic nerves were white; in the left eye some arteries as fine as threads could be discerned; in the right none could be found. In both eyes the veins were of extreme tenuity. There were no other lesions. We have, therefore, seriously diminished heart action and an impoverished state of the blood." This child died of lobular pneumonia. Knapp says that once before he performed paracentesis in a like condition in a boy, ten years of age, but without benefit. He quotes Mauthner's opinion that Secundi's case was undoubtedly one of neuroretinitis. Stellwag (third edition) advocates retrobulbar neuritis in such cases, but in a fourth edition, 1870, he explains them by spasm of vessels.

In the Transactions of this Society for 1880 Dr. Knapp has recorded the case of Laura M., aged thirty. She had been well and strong until lately. Her father had a severe illness, which, during the past seven months, required constant care and night nursing, all devolving upon her and her younger sister. He died a few weeks ago. She grieved very much, and during his illness had fallen away and become feeble and pale. She had noticed flashes and scintillations of light in the right eye. Five days ago she noticed that, without assignable cause, the sight of the left eye was obscured from above downward, so that in the course of several minutes complete darkness occupied the upper half of her visual field. This lasted unchangeably for four days, when, yesterday, the lower half was as suddenly and completely obscured as the upper. She had felt no pain or any uneasiness in any part of her body, but could not see a ray of light with her left eye. On examination I (Dr. Knapp) found the external appearances and motions of both eyes quite

normal, with the exception of the pupils. The right pupil was small and moved briskly with changes of light. The left pupil was over medium size and did not move at all with changes of light. When both eyes were left open and the right shaded, both pupils dilated promptly and contracted just as readily when the right was exposed to light, but when the left alone was shaded or exposed to light, both pupils remained completely unchanged. Several tests for simulation were negative. Tn. Both discs pale; arteries and veins smaller than normal. My diagnosis was insufficient nutrition of both retinae, which in the left eye had been of such degree as completely to suspend vision. Lactate of iron, generous diet, and exercise were prescribed. In the evening of the same day she could distinguish between light and darkness. Her sight returned from above downward, just as she had lost it, and grew a little better every day. In twenty-two days V = 20/xx; field complete; pupil normal.*

Diagnosis.—In my case the primary condition was evidently one of severe ischemia. Although the look of the fundus was quite enough to make one think of embolism, the bilateral nature of the affection caused instant rejection of the supposition. The possibility of simultaneous bilateral plugging of the central arteries will have to be admitted, but to justify such a diagnosis one would do well to bring anatomic findings to his support. If such a view needs reinforcement by another opinion, I may quote Dr. Allen Greenwood (*loc. cit.*), who says: "E. Stoke (Med. Wochenbl.), in December, 1903, published a case of simultaneous bilateral embolism of the central arteries, with complete recovery in a few days, occurring in a man of eighty who had marked atheroma. One, I think, is justified in hesitating to accept such a diagnosis at the present time, and feeling that some disturbance in the blood or circulation may have precipitated a temporary spasm, causing the sudden loss of vision."

Embolism having been at once rejected, my imagination, guided probably by the history of convulsions, the appearance of the patient, and the absence of other suggestive symptoms, turned promptly to the supposition of arterial spasm as a cause of the opthalmoscopic picture. Further consideration tends

*I owe the abstract to Dr. H. F. Hansell. The case is referred to by Schöbl, Norris and Oliver's system.

to confirm belief in the correctness of this *apercu.* Writing of embolism of the central artery, Panas (*Traite des Maladies des Yeux, Paris,* 1894, p. 625) asserts that, "thanks to characteristic symptoms . . . . the diagnosis of embolism of the arteria centralis cannot be doubtful; except compression of the optic nerve by a tumor, apoplexy of the sheath, which has been established by Magnus, or an acute retrobulbar neuritis, there is nothing which might deceive us. But by remembering that in the first case there is exophthalmos, and that in the other two the blindness is usually bilateral, we can arrive at certainty." In the present case the absence of all symptoms and the integrity of the fields deny the presence of retrobulbar neuritis, while the lack of etiologic factors, injuries, diseased vessels, hemorrhagic meningitis (Noyes, *loc. cit.*), and of the red optic disc, extended retinal haze, and small veins, make unlikely the presence of hemorrhage into the nerve-sheath.

It is clear that but thin partitions divide the diagnosis of essential ischemia of the retina, the remaining possibility, from that of arterial spasm. The subjects of ischemia, says Noyes (*loc. cit.*), have always been persons who have been much prostrated by illness, and we have seen that this was true of von Graefe's case, in the case of Dr. Knapp, cited by Noyes, and in Dr. Knapp's second case, abstracted on page 545.* But while these distinguished observers have lent their weight, and though Professor Jos. Schöbl, in his article in Norris and Oliver's System (vol. iii, p. 413),† speaks of "those rare instances in which ischemia occurs as a more or less independent affection," expressions of doubt as to the reality of the condition are not lacking. Von Graefe (Noyes, *loc. cit.*) examined the retinal circulation of cholera patients "when they were in the last stages of prostration, and never failed to find blood in the vessels; and they had correct vision as far as could be ascertained. He, therefore, thought that some obstructive cause was to be assumed in cases of ischaemia, and that it was likely to be found in the optic sheath. It seems likely that we have a partial thrombosis behind the eyeball, and that these cases are to be referred to this head." De Wecker, in his Ocular

*A Case of Ischemia Retinae, published in the Transactions of the Medical Society of New York, 1878, I have been unable to see.

†Professor Schöbl refers to Alfred von Graefe, Arch. f. Ophth., Bd. viii, S. 143; Heddeus, Klin. Monat. f. prak. Aug., 1865; Rothmund, ibid., 1866; Secondi, Caso di Amaurosi per Ischemiam, Turin, 1866, and Knapp, Trans. Amer. Ophth. Soc., 1880.

Therapeutics (ed. Linton Forbes, London, 1879), writes: "Anaemia or 'ischoemia' of the retina, when it is not the consequence of direct compression of the vessels in the optic nerve or in the orbit, is the result of an excessive and prolongedd condition of general anaemia. I must remark, however, that chlorosis has but little tendency to affect the caliber of the vessels or the color of the disc, and this because of the constant point at which the intra-ocular tension is maintained." In cases of malarial anemia, with hemorrhages into the retina and in profound syphilitic anemia, I have never observed a condition of retinal ischemia at all comparable to that seen in the case under consideration. Now, the reality of spasm of the retinal arteries rests upon a firmer foundation. It seems impossible to think that anything but a spasm of the arterial muscle-walls could have caused the phenomena in the cases of migraine and hemicrania, in the case of helminthiasis (Wilbrand and Saenger), in the two cases of Noyes, the ice-bag case of Zehender (Greenwood), not to mention poinsoning by quinin and other drugs. The only question seems to be as to the length of time such a spasm may last. In Quaglino's case Wilbrand and Saenger) the phenomena lasted from five to fifteen minutes; in Faravelli's case, ten minutes (W. & S.); in Noyes' first case, from a few moments to thirty minutes; in his second, twenty-four hours, when amyl nitrite was given. Alexander's case (W. & S.), which most closely resembles mine, from the length of time it was carefully observed and the complete absence of all suggestive symptoms, seems inexplicable upon any other hypothesis than that of arterial spasm. His patient grew worse for twenty-two days, when amyl nitrite was given, and recovery was completed in four months. In my case, without treatment, improvement began in twelve days, was far advanced in three and one-half months, but could not be called completed until nineteen months had passed.

Etiology.—Consideration of the etiology of the case makes more likely than any other the diagnosis of arterial spasm. Arteriosclerosis is out of the question, and all the ordinary poisons can be safely excluded. The patient was not conspicuously anemic, and the hemoglobin never fell below 70 per cent.; she had not been prostrated either by illness or fatigue. Here is a rather delicate girl of thirteen, in whom two internists and a neurologist can find nothing markedly abnormal—no stigmata

of hysteria; yet all agree that she comes of a neurotic family and shows plain signs of an unstable nervous constitution. Her sister, in whom menstruation was delayed, had convulsions. She herself had convulsions at two years of age, and again at thirteen, just before the loss of sight, and has albuminuria for more than a year, and then, after her first menstruation, delayed, even in this warm climate, until past fifteen, all these derangements vanish. Is it not likely that the convulsions, the amenorrhea, the albuminuria, and the retinal ischemia were all dependent upon vasomotor disturbances in the corresponding organs? Shall we suppose that an altered state of the blood, due to the retention of the unknown constituents which should have been eliminated by the kidneys and in the menses, affected in this evil way the nervous elements? Or, is it not more probable that we had here a nervous system faulty from the first through inheritance, unable to regulate nicely the blood-supply to every portion of the body, and that in the imperfection of excretion by means of the kidneys and the menstrual flow we see merely the closure of a vicious circle. "Does it not greatly help to define our views of hysteria and neurasthenia, or of the condition that is now fashionably termed psychasthenia," says Dr. Edsall, "to know that every conceivable symptom of these estates occurs in carbon-bisulphid poisoning, and that hysteric laughter and tears are common in chronic manganese poisoning?"* We should remember, then, whenever we solace ourselves with the adjective *neuropathic*, that in most cases it serves but to carry us back one link further along the chain of etiologic explanation toward the dim-lighted labyrinths of physiologic chemistry.

Addendum.—Since reading this the patient has been seen once again. Vision = R. E., 80/xx; L. E., 20/xv. Careful examination convinces me that the right disc is paler than its fellow.

*Dr. David Edsall, Phila. Jour. Amer. Med. Assoc., December 1, 1900.

A CASE OF SPONTANEOUS THROMBOSIS OF THE CENTRAL VEIN OF THE RETINA FOLLOWING PARTURITION.

By Aaron Bray, M. D.,

PHILADELPHIA, PA.

Medical Director to the Trachoma Institute and Ophthalmic Surgeon to the Lebanon Hospital. Ophthalmologist to the Jewish Consumptive Institute.

Thrombosis of the central retinal vein is not infrequently seen in the old where there is a manifest general arterio-sclerosis present, but it is very rare indeed in the young. Its occurrence in the young and especially when the condition is attributable to strain during labor, it at once becomes of considerable interest so that a report of this interesting case is not entirely out of place. As far as I could glean the literature, I found no case reported of thrombosis of the central vein of the retina following labor.

Thrombosis of the central retinal vein has been first described by Leber and was afterwards studied by Michel, Angelucci, von Ammann, Schöbl and Coats. From all these observers we learn nearly all cases appear in old age between 50 and 70. Von Ammann found in Haab's clinics, among 20,000 patients, 20 cases of thrombosis of the central retinal vein; fifteen of these ranged in age between 50 to 80. Most authorities agree that the cause of the condition is to be ascribed to sclerosis of the blood vessels. In fact the post-mortem investigation and a microscopic study always revealed an arterio sclerosis of a general nature.

Thrombosis according to von Ammann occurs usually in persons that are required to do hard labor and especially where they have to stoop while working. In von Ammann's cases 13 were peasants and 2 smiths.

Sometimes the clinical picture alone may not be sufficient in diagnosing this condition with absolute certainty, but the case I have the privilege to report is of such classical nature that a post-mortem miscroscopic evidence is not deemed essential to verify the diagnosis. Clinically the author's case is a thrombosis of the central retinal vein.

Mrs. C. S., aged 19, was delivered of a healthy baby on June 15, 1910, by Dr. Shaham, of Philadelphia. This woman, according to Dr. Shaham, suffered from a chronic endocarditis for a number of years. In fact Dr. Shaham wisely warned the family against her marriage. Labor was normal and comparatively easy. She was in active labor not more than three hours, but suffered from false labor pains for about two days. For ten days the patient was getting along splendidly, says Dr. Shaham, excepting for a little inconvenience resulting from the intense heat, which, however, left no impress upon her general constitution. On the tenth day her feet began to swell, the edema gradually extended upward and at the same time she complained of sudden blindness in the left eye. I saw the patient on June 27th. I found her a very delicate, frail little woman, suffering from rupture of compensation. The patient looked very pale, almost bloodless, her face was pinched, her legs swollen, breathing rapid, pulse rapid and weak, irregular and intermittent. According to Julius Salinger, who saw the case in consultation with Dr. Shaham, the patient "suffered from rupture of compensation due to mitral stenosis and insufficiency—a lesion of long standing, probably the result of an attack of acute articular rheumatism and influenced by pregnancy." Ocular examination revealed the following condition: Right eye; pupil 3 mm., reacts to light accommodation and convergence. Left eye; pupil 6 mm., does not react to light well, consentual reaction present; left eye fails to converge beyond the median line. The eyes were quiet, the conjunctiva very pale, practically blanched. Vision in the left eye, fingers from about 10 inches distance. Ophthalmoscopic picture; the media is clear, disc irregular, edges not defined, somewhat hemorrhagic, slightly swollen, the arteries somewhat narrower and paler than normal, the veins dilated, tortuous and kinked as they emerged from the disc and were interrupted in their course by large hemorrhages. Throughout the retina, which was hazy at several places, numerous hemorrhages of different sizes are seen, including the macula, which was of a yellowish color. The veins were filled with dark blood, interrupted in their course by hemorrhagic exudations. The hemorrhages were irregular in size and shape and spread throughout the entire retina. The condition according to the patient came on suddenly. By a process of exclusion, aided by the history of

the patient, and the cardiac condition, and above all the ophthalmoscopic picture, I diagnosed the case as spontaneous thrombosis of the central retinal vein.

The question whether the strain in consequence of labor had anything to do with the causation of this condition is not an easy matter to answer, for it must be remembered that the condition occurred when the patient was on the road to recovery. Yet we are of the opinion that the pregnancy and labor must be considered as a contributory factor in the causation of the rupture of compensation as well as the thrombosis of the vein. Thrombosis of the central vein of the retina is usually unilateral and follows some great physical strain. The case is of interest to show that pregnancy in cardiac conditions, endangers the visual function of the eye, and may also cause death. In this case the patient died July 5th. No post-mortem examination was made. I feel, however, that the clinical picture justifies the diagnosis of thrombosis of the central vein of the retina.

VACCINE AND SERUM THERAPY IN OCULAR TUBERCULOSIS.

By George S. Derby, M. D.,

BOSTON, MASS.

The furor created by Koch's announcement at the Berlin Congress in 1890 that he had discovered a cure for tuberculosis will not be soon forgotten. And, although it was a secret remedy, nevertheless, on account of the great reputation of its discoverer, it was at once adopted by many practitioners. Together with their confrères in other branches of medicine the ophthalmologists began to test tuberculin, or lymph, as it was called, and a number of articles on the subject were published in 1891 and 1892. Cases of scrofulous eye disease, lupus of the lids, tuberculosis of the conjunctiva, sclera, cornea, pectinate ligament, and iris were treated by Uhthoff,[1] Sattler,[2] Cohn,[3] Schaffranek,[4] Gepner,[5] Albrand,[6] Silex,[7] Wagner,[8] Landgraf,[9] Königshöfer and Maschke,[10] Schweigger,[11] Leber,[12] Gradle,[13] von Hippel,[14] Enslin,[15] Schwann,[16] and Haase.[17] On the whole, their results, even with the mistaken technic of that time, were encouraging, and the wide-spread adoption in ophthalmology of this new remedy might possibly have taken place at this early date. Soon, however, reports began to appear from many sources telling of unfortunate results in pulmonary cases, and the rapid discrediting of tuberculin was no less dramatic than its introduction. This was especially due to the work of Virchow, Baumgarten, and Hansemann, who showed beyond doubt that the lymph could cause the general dissemination of a tubercular infection throughout the body. Furthermore, although Dönitz[18] and Sattler[19] had obtained favorable therapeautic results by the use of tuberculin in the experimental ocular tuberculosis of rabbits, Baumgarten,[20] Alexander,[21] Gasparrini and Mercanti,[22] Yamagriva,[23] Czaplenski and Roloff,[24] Baas,[25] Kostenitsch,[26] and Trudeau[27] came to opposite conclusions on guinea-pigs and rabbits. And, finally, when Koch announced that tuberculin was a toxin derived from cultures of the tubercle bacillus, ophthalmologists, as well as the rest of the medical profession, took fright, and little more was heard of tuberculin in ophthalmology for a decade.

Koch had been led to his discovery by finding that guinea-pigs could be immunized against tubercular infection by the injection of tuberculin. He began his treatment on the human with large doses, but urged the profession especially that the essential point of the new method was in its earliest possible application, saying "that the later cases furnished an inexhaustible source of ever fresh infection." The astonishing cures which ocasionally followed the use of tuberculin in large doses led to overconfidence, and advanced cases were treated with too large quantities of the new remedy, leading to severe reactions, injury, and even death. Koch had warned against it. Its failure to work on guinea-pigs could be laid to the fact that these animals act very differently to tubercular infections than does the human; that they succumb to infinitesimal inoculations with bacilli, and yet stand infinitely larger proportional doses of tuberculin than do men.

It is far easier to introduce a new remedy than to restore to favor one that has been discredited. In spite of the general reaction of the medical profession against tuberculin, certain far-sighted workers still retained their confidence in its power and held fast to it through thick and thin. Among these were Goetsch, Hager, Krause, Thorner, Carl Spengler, and Petruschky. It was seen that large doses were often disastrous, and so even in 1891 the mild method of administration was inaugurated, at the same time, but independently, by Ehrlich and Guttmann and by Petruschky. In 1901 it was again brought to the front by Goetsch. Koch's original view was that, as tuberculin caused necrosis of tubercular tissue and only acted on living tissue, it was logical to give big doses. He assumed that, at first, much living tubercular tissue was present, and that a small dose at that time was sufficient to cause a severe reaction. A certain amount of tissue, however, disappeared at each injection, and thus increasing doses were necessary in order to obtain the same amount of reaction as before. Also a certain amount of toleration was established. On this basis Koch assumed that the gradual disappearance of the tuberculin reaction was a sign of casting off and healing of the tubercular tissue. This view is not tenable, however, and we must regard the process as one of immunization against a bacterial toxin. (Bandelier and Roepke[28]).

Although the first reports were undoubtedly exaggerated, the

very evident danger of using large doses of tuberculin led the above-mentioned observers to give small doses and avoid reactions as far as possible.

After 1893 tuberculin was largely given up by the ophthalmologist, and between that year and 1900 there is but one observation on its therapeutic use on man. In 1898 Zimmermann[29] reported a case in which the left eye of a patient having been enucleated for tuberculosis, the right eye became infected and was apparently saved only by tuberculin. (T. R.) injections.

This is also the first record of the use of T. R. in ophthalmology, and to the writer's knowledge the first use of the mild dosage.

In 1897 Koch brought out new tuberculin (T. R.),* which he announced contained only curative substances, while old tuberculin (T. O.)* contained toxic bodies also.

Zimmerman[29] published favorable results on the use of T. R. in the experimental ocular tuberculosis of rabbits, but his results were regarded as accidental, and of no value, by Baumgarten and Walz,[30] who soon after published experimental work of a like nature, but which led to conclusions diametrically opposed to those of Zimmermann.

Zimmermann's paper excited little interest in the profession, and Schieck's[31] exhaustive study, which appeared in 1900, secured but little more attention.

Schieck,[31] working in the Halle clinic under von Hippel, reported five cases of ocular tuberculosis, part treated by T. O. and part by T. R. His article contains an analysis of the literature up to that time, and a series of observations on the treatment of experimental ocular tuberculosis in rabbits with tuberculin. His clinical results on human tuberculosis were distinctly favorable, recovery taking place in all cases. In addition he collected from the literature all the previously reported cases of tuberculosis of the iris, and found available for his purpose 103 eyes treated by the older methods. Of these eyes, 39 were cured and 64 lost—a percentage of cure of 37.8. In 13 cases treated with tuberculin all were cured—100 per cent. To quote from his summing up (p. 301): "All cases treated

*In the later pages of this article will be found a brief description of the preparations of tuberculin commonly used in ophthalmology.

by injections, even the most severe forms . . . were cured. Not a single eye came to enucleation; indeed, in 12 cases not only could the form of the eye be saved, but also some of the function. To this striking result the important fact must be added that the retention of the tubercular eye, as far, at least, as the literature goes, causes no damage to the general organism; neither does the use of injections. The fear of a dissemination of the bacilli from a tuberculosis of the iris through the use of Koch's remedy is not confirmed by experience."

Schieck sought to confirm his observations on the human by animal experimentation, but his results were uncertain and even unfavorable. It would perhaps have been better to have let the clinical results stand for themselves, and to have published the experimental conclusions separately. However that may be, we must regard his work as of the first importance. It excited some interest, but not the general recognition which it deserved. However, beginning soon afterward, tuberculin began to be used again in ophthalmology, even if in a sporadic way, and between 1900 and 1905 we find articles by the following authors: Reimar,[33] Morax and Chaillous,[33] Falckenberg,[4] Handmann,[35] Petella, [36] Salie,[37] Haab,[38] Morinami,[39] Weigelt,[40] Groenouw,[41] Hess,[42] Schoeler,[43] von Hippel,[44] and von Michel.[45] Of these, von Hippel was really the first to apply tuberculin therapy consistently, and it is due to him more than to any one else that it made its way at this time into ophthalmologic therapeutics.

His important publication of 1904 was not the recital of a few hastily collected cases, but the outcome, as he says, of over ten years' experience with this remedy. He was led to its use by the exceedingly unfavorable results following the treatment of severe tubercular disease of the eye, believing that the danger in its use, set forward especially by the pathologists, did not hold in ocular tuberculosis, and that in many of these cases tuberculosis elsewhere could not be detected, and that in ocular tuberculosis the number of bacilli in the tissues were notably few, and thus the danger of metastasis was very slight. Further, he says: "It (tuberculin) saves not a small number of eyes that, according to the views of the present day, are destined for enucleation, and, indeed, in part with the retention of a serviceable amount of sight." In the beginning

of his work he was handicapped by the fact that old tuberculin was uncertain in its action, and not infrequently caused reactions at place of injection and also a rise of temperature. This led to long interruptions of treatment, and thus numerous recurrences occurred, which later experience has shown could have been avoided by consecutive use of the remedy. "Since the adoption of new tuberculin T. R. these unpleasant complications have become uncommon, and the success of the treatment much more certain." His method was as follows:

Begin with an injection of 1/500 mg. of the dry substance, and repeat every second day, taking the temperature every two hours, increasing each time 1/500 mg. From 1/50 mg. the dose is increased by 1/50 mg. each time. From 10/50 mg. by 4/50 or 5/50, so long as the temperature stays normal. If it rises over 38° C., he injects the same dose two or three times and increases it only when the patient shows no general reaction. It is unnecessary to go over 1 mg. He warns against beginning with larger doses, as he has seen corneal nodules break down and ulcerate.

To obtain a permanent cure it is of the greatest importance to inject long enough—in the severest cases six months and over. Injections must be continued until all signs of inflammation have disappeared, until all precipitates on Descemet's membrane and all floating vitreous opacities have been absorbed. It might be said that von Hippel was the father of modern tuberculin therapy in ophthalmology, but Dor's statement is incorrect that he (von Hippel) "established the technic of a treatment which is applicable to all the other branches of medicine"; for, as has been previously shown, this was inaugurated in the earlier days of tuberculin. Von Hippel published 13 severe cases of ocular tuberculosis which had recovered under his treatment, and had remained well for periods ranging from six months to nine years. At the Heidelberg Congress the following year he reported 14 more cases with favorable results, although the period of observation was considerably shorter.

Following von Hippel's work, tuberculin began to be used more generally, and since that time a large number of articles on its use have appeared—in 1905 papers by Gilbert,[46] Lundsgaard,[5] von Hippel,[8] Gamble and Brown,[9] Jessop,[20] Bulson,[51]

Risley,[52] Schwartz,[53] Stanculeano,[54] Kayser,[55] Reunert,[56] and Fleischer.[57] Gamble and Brown's paper contains a valuable summary of the literature to date. Schwartz succeeded in curing a case of tuberculosis of the conjunctiva by injections of Marmorek's serum. At the Heidelberg Congress von Hippel's second publication was discussed by Sattler, Halben, Uhthoff, Czermak, Haab, and Purtscher, all of whom had obtained favorable results from tuberculin. In 1906 we find the articles of Rohmer,[58] Capolongo,[59] Wilder,[60] Reuchlin,[61] Risley,[62] Wolfrum,[63] Brückner,[64] Török,[65] Stargardt,[66] Koster,[67] da Gama Pinto,[68] Jessop,[69] Ziegler,[70] and Parker,[71] most of whom are enthusiastic in its favor. Diem,[72] who records 32 cases treated with old tuberculin, saw good results in a majority, but in by no means all. Darier[73] suggests that where a local reaction of dangerous severity occurs in the eye, it can be controlled by subconjunctival injections of guaiacol. Axenfeld[74] strongly recommended tuberculin in tubercular infections of the uveal tract, according to von Hippel's directions. He regards its success as undoubted. Tuberculosis elsewhere in the body is favorably affected. The year 1907 was marked by several important articles which appeared. Stock[75] published most important observations on the frequent tubercular origin of chronic iridocyclitis, and recommends T. R. strongly in its treatment. In his opinion cases of chronic disseminated choroiditis are less favorably influenced by it than is the more anterior involvement of the eyeball.

Collin[76] reports 25 cases treated with von Behring's preparations, Tulaselaktin and Antitulase. These preparations now, however, possess only historic interest (Baudelier and Roepke).

Török[77] reports 16 cases, 10 of whom were cured, 4 improved, and 2 negative. Helbron's[78] success was not striking. Bock[79] reports the unsuccessful use of Marmorek's antitubercular serum in scrofulous affections of the eye. The first influence on the eye of Wright's work on the opsonic index is seen this year in the article of Hancock and Mayou,[80] who report 9 cases treated with partially good results, using small doses of T. R. and following the index carefully.

Other reports which appeared are those of Snell,[81] Lubowski,[82] Erdmann,[83] Krstitch,[84] Bull,[85] and Herford.[86]

In 1908 Allen[87] reported good results in choroidal tubercu-

losis and in infections of the orbital bones. He was less successful in phlyctenular keratitis and in scleritis. He advised controlling the tuberculin dosage with opsonic index estimations, and if this is not used, wait a considerable time between injections—three weeks to one month. Begin with 1/100,000 mg. and increase slowly to 6/10,000. Eye infections with tuberculosis may be due to either a human or bovine strain—therefore in some cases bovine T. R. is better than human. Begin with human tuberculin, and if there is no definite improvement in two or three months, change to bovine, or mix the two in equal parts. If the eye disease be secondary to a glandular infection, use a bovine preparation; if secondary to a pulmonary infection, use a human product.

Schumacher[88] treated 48 cases with from 11 to 42 injections; the shortest recovered in one and one-half months; the longest, in eight months. He reports fairly immune recurrences, but, on the whole, the results were good, though not so striking as von Hippel's.

Verhoeff[89] disagrees with the views of the majority regarding several points. He believes that the therapeutic use of old tuberculin has been too quickly abandoned, and that for the best results it is necessary to obtain, at least once, a general or a local reaction; on the next injection, which comes ten days later an attempt is made to fall just short of a local reaction. Where no reaction has taken place, injections are given at four-day intervals.

Davids,[90] in a report from the Göttingen Clinic, presided over by von Hippel, speaks of the advantage of the new preparation, Tuberculin B. E. (bacillus emulsion) over the older preparations. They have used it since 1906. Von Hippel saw recurrences after treatment with T. R., and communicated with Koch, who furnished him with this new preparation. Davids[90] reports 10 cases in which B. E. was used with extraordinarily favorable results. Duration, one to two years. He believes that it is a better preparation, and also much cheaper.

Other articles which appeared in 1908 are those of Török,[91] who continues his valuable work, Bock,[92] Alessandro,[93] Krämer,[94] Rohmer,[95] Derby,[96] Fejer,[97] and Lichtenstein.[98]

In 1909 appeared an extensive article by Dor[99] in which he covers the history of the use of tuberculin from its beginning

at the Berlin Congress in 1890, at which he was one of the interested listeners. He speaks of the good results obtained with T. R., and publishes eight cases treated with Beraneck's tuberculin, of which preparation he is a very enthusiastic adherent, both on account of the favorable results obtained by it and also on account of its simplified dosage.

Junius[100] is also an adherent to Beraneck's tuberculin, for convenience and on theoretic grounds. He has found it to work well in ocular tuberculosis.

Zur Nedden[101] emphasizes the fact that tuberculin treatment is no more nor less than an active immunization, and that we can expect a cure only when the body possesses the power to react in the right way to the injections—that is, the power to form the necessary curative substances. Persons in poor general condition are not likely to have this power, but even when the general condition is good, it is not possible to say that a tuberculin cure will be successful, as the reacting power of the tubercular human body cannot be calculated and is very variable.

He does not believe that it is possible to cure all cases of ocular tuberculosis with tuberculin, and cites two cases of his own where, in spite of the most careful treatment, a cure could not be obtained.

He believes that von Hippel's method of injecting every third day is too frequent, while, on the other hand, the infrequent injections of Wright's method do not give the best reuslts. The opsonic index estimation is of little practical value, since the method is very complicated and the phagocytic index does not fairly indicate the progress of the disease. Small doses, as practised by Wright, are not sufficient, and a gradual increase is now considered the best practice. Only the results of a large clinical material will show us which is the best tuberculin preparation, but it is again being recognized that old tuberculin, previously discarded for treatment, is regaining favor, and may be regarded as an efficient preparation.

Stock[102] gives his experience of a year with the opsonic index, and concludes also that it is of little practical value in conducting a tuberculin cure, but that careful observations of temperature and general conditions should be made on

each patient to determine the individual doses of tuberculin best suited to his particular case. Weeks[103] has collected 58 cases of various forms of ocular tuberculosis treated with tuberculin. Of these, 35 were virtual cures and 15 were improved. His work shows that tuberculin is favored by a large majority of the ophthalmologists in the United States.

Other articles appearing in 1909 are those of Clark and Wright,[104] Laas,[105] Hornike,[106] Derby and Ayer.[107]

In the last number of Graefe's Archiv., A. Leber[108] discusses at length tuberculin immunity and tuberculin therapy, and states his preference for old tuberculin, as it is more uniform than the newer products, shows less tendency to cause a local reaction, is easier to use, and is more certain as to dosage. He prefers to begin with very small doses, which will not cause either a local or a general reaction—for adults, 1/500 mg. of old tuberculin; for children of two years and older, 2½/10,000 to 5/10,000 mg. He emphasizes the importance of using freshly prepared solutions. Mild local reactions are not injurious, but a too hasty increase in dosage may easily lead to an injurious general reaction. To avoid this, a careful reading of the temperature is indispensable—a rise shows that the action of the tuberculin is not confined to the diseased area, but has spread to the general organism and has caused an injury. Leber does not interrupt his dosage unless the temperature rises over .3° C. From that to .5° C. he repeats his dose. Over .5° C. he lengthens the interval and goes back a dose. The normal interval is four to five days. The opsonic index is not of practical value. In his 13 cases reported here the results were favorable.

In his opinion tuberculin has a specific action on the diseased focus; therefore local reactions are unavoidable and indispensable for a cure; they should, however, be limited to the smallest degree possible.

A careful study of the literature and the writer's own experience with tuberculin, now extending over four years, point out the fact that certain tuberculous affections of the eye are less favorable for treatment than are others. It is generally recognized that conjunctival tuberculosis is most resistant to tuberculin injections. Perhaps we may explain this by assuming that in the conjunctiva the disease is usually primary.

Of the bulbar types of tuberculosis, there is some ground for believing that the choroidal is less amenable to treatment than are the other forms.

In the opinion of nearly all writers the tuberculin treatment has proved of decided value in ophthalmology, and deserves to be taken up by all who treat this form of ocular disease. It will not help all cases, even when used in the most approved fashion, but it can be so administered that those who are not benefited at least will receive no harm. Tuberculin is a powerful agent, even in minute doses, and should be intrusted only to those who have been carefully instructed in its use and who realize what they are trying to accomplish.

Tuberculins.—What is the best preparation to use?

This question cannot be answered at the present time. It is probable that beneficial results may be obtained with all the standard preparations. On general principles, however, the filtrates or solutions, such as Koch's old tuberculin T. O., and those of Denys, B. F., and Beraneck, T. B. K., are safer for the beginner, more uniform in their dosage, and less likely to cause noticeable reaction than are the emulsions or vaccines T. R. and B. E. Theoretically, B. F. and T. B. K. are better than preparations in which heat is used to manufacture. Thus far there is not enough evidence available to decide the relative merits of human and bovine extracts.

Tuberculin solutions should be reasonably fresh, and should be renewed from the stock solutions not less than once every two or three weeks, and it is advisable to make very high dilutions weekly. Even the 0.5 per cent. phenol solution used in making the dilutions is sufficient to cause deterioration in the tuberculin after a time. The emulsions should always be thoroughly shaken before measuring off the dose. Directions for making the dilutions come with all tuberculins. Where a considerable number of patients are to be treated, it is desirable and convenient to make up a number of dilutions of varying strength. Dilutions of 1:10 are convenient and in general use.

Syringe.—A glass syringe of 1 c. c. capacity is preferable, on account of ease in sterilization and measurement. At the Tuberculosis Class of the Massachusetts Charitable Eye and Ear Infirmary a glass syringe with asbestos packing has proved reliable and cheap.

Injections are best given in the back, below the scapula, alternating the side on each successive occasion. For convenience, however, the upper outer aspect of the arm may be used. The skin is cleansed with ether or alcohol, and the puncture may be closed with collodion if desired.

Dosage.—Authorities are divided on what tuberculin accomplishes. If the theory of specific bacterial immunity be accepted, then general and focal reactions hold a place in the treatment. They hold no place, however, in Wright's method, for he regards fever reaction as a manifestation of a negative phase, and simply tries to measure the amount of specific immunity produced by opsonic index determinations.

The adherents of the toxic immunity theory also try to avoid reactions, regarding them as evidence of intolerance; they produce no specific immunity, and although when mild they do no harm, in their severer forms they injure the patient's general condition and make the disease focus more active.

Bandelier and Roepke,[28] whose excellent treatise should be known to all those who use tuberculin, state: "If a mental picture is to be made of the curative action of tuberculin in the light of present-day knowledge, it must be based on a consideration of the two specific factors of its action—the production of toxic immunity and the local hyperemia" (p. 85).

In the face of these diverging views we must rely on clinical experience alone to guide us.

Certain observers, and they are now in a small minority, at least as far as ophthalomology is concerned, use large doses at infrequent intervals, intending thereby to produce a marked local reaction.

This practice, it seems to the writer, should be discouraged, as it is pretty definitely established that such heroic measures may produce harmful results not only to the eye itself, but also to the whole organism, for it must be remembered that with this method of injection we have no way of conrolling the severity of the reactions. On the other hand, Wright and his school maintain that the administration of very minute doses, 1/100,000 to 1/10,000 mg. of new tuberculin, repeated at long intervals and increased only to a slight extent under the control of opsonic index estimations, is the proper method of administrations.

The choice of the great majority lies between the two extremes. The initial dose should be small—T. O., 1/500 to 1/100 mg.; B. E. and T. R., 1/1000 to 1/500 mg.; B. F., 1/10,000 to 1/1000. (The writer prefers the smaller doses in each case.) It should be increased slowly and with great care, avoiding, as far as possible, all signs of reaction, both general and local. When increasing from one solution to the next higher, the step should be gradual, e. g., 9/10,000, 1/1,000, 1.5/1,000, 3/1,000, etc. It is not unlikely that slight local reactions occur with each injection, but these, when slight, are probably beneficial, and every effort should be made to keep them at a minimum.

Frequency. Von Hippel regarded two days as the proper period between injections; later, Wright and his school advised much longer periods—eight or nine days, up even to three or four weeks (Allen). Again, a middle course seems desirable, and four to five days may be taken as the average time between injections. It is most important, however, to have no settled rule, but to treat each case on its own merits. The rate of increase and frequency of dosage may be controlled by careful observation of the temperature, which is best taken four times daily, by the pulse, by careful attention to the general condition of the patient, loss of appetite, malaise, etc., and by careful observation of the eye itself when that is possible. A local reaction at the point of injection may also give evidence of a beginning intolerance. After a rise of temperature of more than .5° F., or any other toxic symptoms, the previous dose should be repeated until it no longer causes disturbance. If the toxic symptoms are pronounced, the interval should be lengthened or the next weaker dose given, or both. It is best not to inject during the first few days of the menstrual period. The treatment of many patients may be carried through without the signs of a reaction, but in most instances at some period the symptoms of intolerance appear, and we should be on the lookout for them. Marked reactions may lead to hypersusceptibility, and then even if the dose be considerably reduced, the patient continues to react. In such cases Trudeau[109] advises discontinuing injections for from ten days to two weeks, and then beginning again with a far weaker dose, and increasing very gradually.

To quote from Trudeau[10] again, "the main features of our treatment would be—

"1. To raise the point attainable in each case by an almost imperceptible and long-continued progression in dosage.

"2. To avoid general and focal reactions as much as possible, and to consider them merely as evidences of intolerance.*

"3. To follow no arbitrary rule as to rate of increase or the maximum dose to be reached, but to be guided merely by the degree of toxin tolerance of each patient, as shown by the symptoms and general condition, whether the highest individual maximum dose attainable be only a small fraction of a milligram or a cubic centimeter or more."

The majority of cases of ocular tuberculosis may be treated as out-patients, coming to the hospital at stated intervals for observation and injection. It is indispensable to have them keep a careful record of their temperature, pulse, and general symptoms in a book designed for the purpose. They should be controlled as closely as possible by having a social worker or nurse visit them in their homes occasionally, and see that they carry out the directions received. It should be strongly emphasized that general tubercular hygiene forms the most important part of the treatment of these cases, and that if we expect to get good results from injections, we must get the system into such condition that tuberculin can be utilized to the best advantage.

In previous papers the writer has pointed out the advantages to be obtained by the establishment of tuberculosis classes in connection with eye hospitals for the treatment of this disease.

In conclusion, the writer wishes to record 30 cases of ocular tuberculosis treated by tuberculin and tabulated briefly; 15 of sclerokeratitis; 9 of interstitial keratitis, and 6 of keratoiritis. The earliest case recorded was discharged cured somewhat over two years ago, while 3 cases of long duration are still under treatment.

On the whole, it will be seen that the results are favorable, although in a number of cases it is by no means certain that a cure would not have taken place as speedily without the

*It should be noted here that Trudeau regards neither the theory of bacterial immunity nor that of toxic immunity as satisfactory, but feels that a dosage based on the latter theory gives the best results.

SCLEROKERATITIS.

NAME.	METHOD OF DIAGNOSIS.	Number of Injections.	Frequency Days.	MAXIMUM DOSE.	Duration of Treatment, Months.	RESULTS.	REMARKS.
G. deC.	Clinical picture. Signs of tuberculosis elsewhere. General reaction B. F.	36	7	1 mg. B. F.	10	Cure.	Very severe case. Nodules in cornea and iris. Pupil tied down. Enucleation advised outside.
M. S.	General reaction T. O.	10	7	2.5 mg. B. F.	10	Cure.	Obstinate case. Improvement not reached till large injections.
J. C.	General reaction T. O.	39	7	3 mg. B. F.	6	Cure of one eye.	As patient was about to be discharged from treatment the previously healthy eye became diseased and patient refused further treatment.
C. G.	Slight general reaction B. F. Marked signs of tuberculosis elsewhere.	21	7	3.5/10 B. F.	4	Cure.	Patient riddled with foci of healed tuberculosis.
A. B. P.	Microscope.	41	7	7.5/100	11	Cure.	Very severe case, with many nodules in cornea and two large granulated growths at limbus.
M. R.	Four slight local reactions to B. F.	42	7	5.5 mg. B. F.	10	Cure.	Patient insists on keeping up occasional injections "to keep eyes well."
Julia C.	Local and general reaction to T. O.	30	7	———	7	Cure.	
S. McD.	Local and general reaction to T. O.	12	7	1/10 mg. B. F. 1 mg. T. O.	3½	Cure.	Marked sclero-keratitis, with old perforating ulcer of cornea. This patient had large therapeutic injections of T.O. before coming under our care.
A. C.	Clinical appearance.	10	7	1/100 mg. B. F.	1	Cure.	Mild case.
Cath. G.	One slight local reaction to B. F.	25	4 to 7	2/10 mg.	5	Some improvement.	Patient refused further treatment.
Jas. M.	General and local reaction to T. O.	105	3 to 7	3 mg. B. F.	28	Improvement	A most resistant case; still under treatment.
L. D.	General and local reaction T. O. Marked pulmonary signs of tuberculosis.	26	7	7/1000 mg. B. F.	9	Cure.	Case first treated with T. O., and reacted sharply to 2/100 mg. on two occasions. It was never possible to raise the dose of B. F. above 7/1000 mg.
A. B.	General and local reaction T. O.	50	7	1/10 mg. B. F.	17	Cure.	Numerous nodules in sclera which developed one after another during treatment. Eye would nearly quiet down, only to flare up again.
I. F.	Clinical picture. Signs of tuberculosis elsewhere. Positive cutaneous test.	11	7	3/100 mg. B. F.	4	Cure.	

NAME.	METHOD OF DIAGNOSIS.	Number of Injections.	Frequency Days.	MAXIMUM DOSE.	Duration of Treatment, Months.	RESULTS.	REMARKS.
N. F.	Clinical picture.	37	7 to 21	6/10 mg. B. F.	15	Slight improvement.	Pupil adherent. Very resistant case. Patient lived at a distance, and treatment was somewhat intermittent. Still under treatment.
W. L.	Clinical picture.	10	7	8/100 mg. B. F.	2	Cure.	Mild case.
Mary D	Clinical type of disease. Signs of tuberculosis in lungs.	28	3 to 4	3 mg. B. F.	3½	Cure.	Large corneal nodule. Iritis.
E. S.	General and local reaction B. F.	47	7	4.5/100 mg. B. F.	4	Cure.	Severe case with many nodules in cornea and iris. Pupil bound down. Enucleation advised outside.
M. B.	General reaction B. F. Signs of tuberculosis in lungs	22	4 to 7	4.5/100 mg. B. F.	7	Cure.	Four puncture reactions in arm. Eight weeks in sanatorium.
W. W.	General and local reaction T. O.	23	4 to 7	7/100 mg. B. F.	4½	Cure.	Diffuse deep corneal infiltrations. Mild iritis.

INTERSTITIAL KERATITIS.

NAME.	METHOD OF DIAGNOSIS.	Number of Injections.	Frequency Days.	MAXIMUM DOSE.	Duration of Treatment, Months.	RESULTS.	REMARKS.
M. J.	General and local reaction T. O.	25	7	8/100 mg. B. F.	7	Cure.	Poor general condition. Diffuse corneal infiltration with very moderate ciliary injection.
M. D.	Signs of tuberculosis elsewhere. Bad family history. Wassermann negative.	22	7	7/100 mg. B. F.	8	Cure.	Poor general condition. Lungs suspicious. Probable tubercular ulcer of larynx.
A. H.	General and local reaction T. O.	19	7	8/100 mg. B. F.	5	Cure.	Diffuse infiltration of upper two-thirds of cornea.
L. S.	Clinical picture. Marked signs of tuberculosis in glands and lungs. No evidence of syphilis.	27	7	3.5/10 m. B. F.	6	Improvement but still under treatment.	Diffuse corneal process with nodule in pectinate ligament.
R. P.	General and local reaction T. O.	22	7	.7/10 mg. B. F.	9	Cure.	Diffuse homogeneous infiltration covering upper two-thirds of cornea.
Josephine M.	Local reaction in eye B. F.	37	4 to 7	5.5/10 mg. B. F.	8	Improvement	Very severe type, with many deep yellow nodules in cornea. Still under treatment.
E. M.	Clinical picture. Signs of pulmonary tuberculosis.	17	7	3/10 mg. B. F.	7	Cure.	Two deep nodules in cornea.
J. G.	Clinical type of disease.	26	average 14	2 mg. B. F.	12	Cure.	Three deep round nodules in cornea. Patient lived at a distance and came irregularly.
C. C.	Clinical picture. Signs of tuberculosis at right apex.	22	7	4/10 mg. B. F.	4	Cure.	Two deep round nodules in cornea.

use of tuberculin. The writer intends to publish the case histories in full at some future time, for only by observation over a considerable period will it be possible to decide whether the cures produced are permanent or only temporary, and only by observation of a large number of cases over years will it be possible to determine the exact value of tuberculin therapy.

TUBERCULIN PREPARATIONS.

Old Tuberculin.—T. O. is a filtrate of tubercle bacilli cultures grown on glycerin broth, concentrated by heat to one-tenth of its volume, and then filtered through porcelain to remove the germs. T. O. contains the soluble products of the tubercle bacillus in a 50 per cent. glycerin solution. This was the original preparation recommended by Koch, and used extensively in the early nineties. Its use now in ophthalmology is confined almost entirely to diagnosis, as it is thought that valuable immunizing properties are lost by the heating process to which it is subjected.

Tuberculin T. R. consists of dried tubercle cultures ground up, treated with physiologic salt solution, and separated into two layers by centrifuging, and the upper one containing the glycerin-soluble substances, and a lower one, T. R., containing chiefly the substance left behind after extraction with glycerin. This has been extensively used in ophthalmology. The initial dose commonly used is 1/1000 to 1/500 mg.

Tuberculin B. E. (bacillus emulsion), which has more recently come into high favor, may be regarded as a mixture of the glycerin-soluble products with T. R. It is suspension of 1 part of pulverized tubercle bacilli in 100 parts of distilled water to which equal parts of glycerin are added. Initial dose, 1/1000 to 1/500 mg.

Tuberculin B. F. (bouillon filtrate) (Denys) is a preparation similar to T. O., except that it is not concentrated by being subjected to heat. Besides the toxins secreted by the living bacilli, it contains only those proteids which go into solution in the culture fluid, and none of the insoluble proteids which remain in the bodies of the bacteria. Intial dose, 1/10,000 to 1/1000 mg.

Tuberculin T. B. K. (Béraneck) has met with considerable favor, and although up to this time used but little in ophthalmology, it is strongly recommended by Dor. It consists of the extracellular toxins of the bouillon culture, together with intracellular toxins extracted from the bodies of the bacilli with 1 per cent. phosphoric acid. Theoretically, therefore, it should contain, as far as possible, all substances having immunizing properties, and avoids the danger, common to the emul-

sions, of containing live bacilli and toxins possibly harmful. It is supplied in 15 different solutions, each one double the strength of the preceding one. First dose for children under twelve, 1/20 c. c. of solution A 128; adults, 1/20 c. c. solution A 32, best for weak persons. Besides these preparations, there are innumerable others which cannot be mentioned here, but which may be found in Bandelier and Roepke.[28]

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OBITUARY

ABNER W. CALHOUN.

On Saturday, August 21, 1910, there passed away at his home in Atlanta, Georgia, after a life of unusual usefulness, our friend and confrère, Abner W. Calhoun, at the age of 65, years, during which over forty years was spent in medical work. A native of Georgia, born April 16, 1846, at Newnan, Georgia, the son of Dr. Andrew B. Calhoun, who was in his generation an eminent Southern practitioner. His mother was one of the Wellborns of Wilkes County, one of the old families of Georgia.

His primary education was gained at the public schools of Newnan, but was interrupted at the age of 15 years by the outbreak of the Civil War. Although he was the youngest member of a military company, a boy of tender years, he was nearly six feet in height and was accepted in the Confederate service, passing through four years of the war, finally coming back home for the last time after surrendering with Lee at Appomattox.

For two years after his return Calhoun continued his studies and then went into his father's office for two more years, at the age of 23 entering Jefferson Medical College at Philadelphia, taking first honor in his graduating class. Then the young doctor returned to Newnan, spending four years in general practice with his father, this proving a fine foundation for his after-career as a specialist.

He then went to Vienna two years, then to Berlin for several months, and after that to London, returning home in 1873, becoming first associated with Dr. Willis Westmorland, and after that branching out for himself.

He was a man of remarkable physique and found that the gruelling pace he set for himself was not usually kept up by his assistants. He became Professor of Ophthalmology and Otology at the old Atlanta Medical College the year after he went to Atlanta, and this connection continued up to a year

or so ago, the institution being one of his prides, he frequently donating to its support and having endowed a chair.

Dr. Calhoun was a member of the American Medical Association and will be long and well remembered by the members of the Section on Ophthalmology, as well as by the American Academy, the American Ophthalmological Society, and his professional associates.

He was best known as a Cataract Operator, having performed over two thousand extractions, and his chief contributions to Ophthalmology were along those lines.

He was a Southern gentleman, the first and, in many respects, the greatest specialist of the Southern States. His five and sixty useful, brilliant years brought not alone light to the eyes of men, but to their souls as well. He gave of his knowledge and genius to the poorest as bountifully as to the richest. He was a success, both professionally and financially, accumulating a fortune from investments and from his profession, dying in the traces when he was just about ready to retire and spend the declining years of his life surrounded by all the joys and comforts a man could wish.

By his friend and for his friends,

H. V. WÜRDEMANN.

Abstracts From Recent Ophthalmic Literature

AMBLYOPIA AND BLINDNESS.

Hysterical Amaurosis.—Fleckenstein, Harvey K., Baltimore, (*American Medicine,* August, 1910), reviews the literature on this subject. There have been reported a total of 44 cases of binocular hysterical blindness. The monocular form is probably more common. The onset is usually sudden, generally associated with some other nervous manifestations and the recovery also sudden. The author's case, reported in detail, was sudden in onset but gradual in recovery. There was no history of any shock, only some family disturbance. The patient was of good physical development and apparently not of a nervous type. There was no reversal of color fields, only general contraction in the unaffected eye. In 24 days vision returned to normal. Another case of hysterical achromatopsia is reported with complete recovery in a little more than two months. M. D. S.

Congenital Word-Blindness (Inability to Learn to Read).—Fisher, H., London. (Report of the May meeting of the Ophthalm. Soc. of the United Kingdom, *Med. Press,* May 18, 1910). After alluding to some of the previously reported cases of the condition, Fisher reported four other cases which had come under his own observation in one girl and three boys. In one of the male cases there appeared to be very suggestive evidence of a hereditary and family tendency to the defect, in another there had been considerable flattening of the left side of the cranium at birth, and a remnant of this deformity could still be easily recognized. He thought it probable that as further examples of the defect were collected the cases would be found to range themselves into two groups: (a) The hereditary group, in which the visual memory center for words residing in the left angular gyrus failed in development; probably in this group a considerable proportion of the the female cases would be found. (b) A group due to limited meningeal hemorrhage over the same gyrus, the result of birth injury. This group would account for the well recognized great preponderance of congenital word-blindness in the male

sex. Obstetricians recognized the greater size of the head in male than in female infants at birth; the more frequent necessity for artificial assistance and the greater risk to mother and to infant in the birth of male than of female children. Mr. Fisher pointed out that larger meningeal hemorrhages at the time of parturition and resulting in birth palsies are twice as common in male as in female children. Mr. Fisher urged the necessity for special and private tuition for children with this defect of congenital word-blindness. He thought the phonetic method of learning to read, making use of the glossokinaesthetic center to aid the visual memory center, less likely to lead to a satisfactory result than endeavors to train a vicarious visual memory center in the right hemisphere; for such training he advocated the "look-and-say" method of learning to read; the child should use the "word" as its unit of observation and study, and not the individual letters. C. H. M.

ANOMALIES.

Congenital Pigmentation of the Cornea.—Halloway, T. B., Philadelphia. (*Ann. Ophthal.*, October, 1910.) Three cases are reported, all in women. None gave a history of trauma. The deposits were bilateral in each case, similar in appearance and in the extent and shape of the deposits in each case. The pigment deposits were situated in the deep layers of the cornea, were brownish in color, were placed vertically in the center of the corneae and were 1 mm. x 3 mm. in size. Vision was not especially affected in any of the cases. There was no persistence of pupillary membrane nor other evidence of congenital ocular deformity. M.B.

BACTERIOLOGY.

The Effect of Operation on the Eyeball Upon Micrococci of the Conjunctiva. Juji Jakahashi (*Wien. Med. Wochensch.*, May 21, 1910).

The conjunctiva was examined both before and after an operation for cataract. The staphylococcus albus was found in 96 per cent. of the cases; the xerose bacillus in 66 per cent.; staphylococcus aurens in 56 per cent. After operation, and under a bandage on the eye the micrococci increased consider-

ably in 26 per cent., moderately in 30 per cent. and not at all in 43 per cent. of the cases.

It was interesting to find that while the operated eye in most of the cases, 8 days after operation, showed no increase of micrococci in its conjunctiva, there always was an increase in the non-operated eye when the latter was bandaged up for 24 hours. The operated eye, therefore, so far as the growth of micrococci is concerned is placed under more favorable conditions than the non-operated eye. This may be explained by the fact that the operation produces a strong irritation with an actual hyperemia near the wound, and an increase of the bactericidal substances in the blood. After the aqueous humor is emptied the new humor contains more antitoxines than the previous one. The increased flow of tears with its efficacious agglutinius causes also the diminution of the amount of micrococci in the operated eye. J. G.

CATARACT.

How Does Cataract Develop? Schoen, W., Leipzig (*Centralblatt für prakt. Augenheilkunde*, August, 1910, p. 225), reports a case of bilateral cataract in a man, aged 34, who exhibited all changes to which the author, in his book on the functional diseases of the eye, ascribes the genesis of senile cataract: Astigmatism from 2.00 to 4.00 D., close work for 20 years, hyperphoria of 4°, overexertion of accommodation, inflammation and proliferation of the capsular epithelium along the insertions of the zonular fibres—whence the thickened circle in the left and equatorial cataract in the right eye—detachment of the capsule from the lens, disturbance of nutrition of the lens. A drawing illustrates the condition. A piece of the capsule between lens border and ring of insertion was circumcised with the intention to remove it the next day with the lens. But an intense swelling of the lens resulted, which was finally absorbed, yielding average vision. C. Z.

The Choice of a Cataract Operation.—Fisher, W. A., Chicago (*Jour. Ophthal. and Oto-Laryng.*, October, 1910, iv, 379), questions the ability and experience of the average operator to do the intracapsular cataract operation, but believes that Smith's technique possesses many valuable advantages that may be made use of in the old method of extraction. The author refers to a number of preventable accidents which might

be largely avoided by improved technique. He believes that loss of vitreous can usually be prevented by discarding the specula and using a lid retractor. He attributes many accidents to faulty position of the eye during extraction of the lens and believes that many such accidents can be avoided by having the patient look up instead of having the eye turned downward during the expulsion of the lens. He has devised a capsule forceps that can be used while the patient is looking up, without danger of dislocating the lens. The author believes that a preliminary iridectomy should always be done. W. R. M.

On the Results of Operation on Congenital Cataract, with Especial Reference to the Comparative Growth of the Eyes Before and After Operation. Grad. August (*Archiv. f. Aug.,* xlviii). This article is based upon the 75 cases operated upon during a period of 15 years in the University Clinic, Würzburg, by Drs. Michel and Hess. The material is summed up by the author in order to clear up certain disputed points. Chief among these is the best age for operating. Some contend that the earlier the operation is performed the better; others hold for a later period in life, because of the greater safety on account of the better behavior of the patient.

Some of the patients under consideration were operated upon by simple decission, the lens substance allowed to absorb. This method was long ago given up. Most of the cases were operated upon by discission, followed in a few days by evacuation of the lens substance, or by the method now and for some time used by Hess. He makes an incision at the limbus, pushing the lance well into the substance of the lens. The lens mass is then evacuated by means of a spoon and spatula for counter pressure.

In double-sided congenital cataract only 25 cases were satisfactorily followed—representing 45 operated eyes. The final visual results were as follows:

S= 1- ½ : 15 Eyes=33⅓%.
S=½- ¼ : 4 Eyes= 9 %.
S=¼-1/10 : 6 Eyes=13⅓%.
S= 1/10 : 20 Eyes=44⅓%.

In deciding upon the time for operation, the author presents the following table:

Age	No. of Eyes.	Vision 1-½	½-¼	¼-1/10	1/10
1 to 5 years	15	26⅔%	13⅓%	26⅔%	33⅓%
5 to 10 years	12	57 %		28½%	14½%
10 to 15 years	9	40 %	40 %		20 %
15 and over	9	100 %			

In deciding upon the selection of the operation, the author presents the following table:

			1-½	½-¼	¼-1/10	1/10
Discission	No. 18	Vision	46⅔%	13⅓%	26⅔%	13⅓%
Extraction	No. 20	Vision	70 %	20 %		10 %

From the above it would seem quite clear that the evacuation was far better than the discission as a method, and also that one should wait till late to operate. The author states, however, that this is not a fixed rule as to time; that though the results are better the older and more tractable the patient, there are cases of double-sided cataract where lack of development would prevent one waiting beyond the second year.

Also the fact that in the table showing the results from the two operations the fact must be weighed that the discissions were done more early in the clinic and upon younger children.

In regard to the development of eyeballs with pathological lens conditions, the author says that the association of congenital cataract with micro-ophthalmus has long been recognized. Recent researches have suggested that the smallness of the bulb is due to the primary lens condition. The author has shown that the removal of the lens leads to a lack of development of the ball. E. C. S.

Remarks on Cataract Extraction.—Dimmer, F., Graz (*Archiv. f. Aug.,* lxvii, 2, 3). The author called attention in 1907 to a method of subconjunctival extraction of cataract. He found that this method did not materially reduce the percentage of secondary infections which he had hoped that it would.

He had practiced it especially in conjunction with the simple extraction operation. This operative method is objectionable because of the frequency of iris prolapse. Hess found that this danger was decreased, as had Pflüger maintained, when a small peripheral iridectomy was done. Weller spoke well of this procedure after a series of 48 cases so operated upon. Recently from Hess' clinic has come a report of 600 extractions with peripheral iridectomy in which there were 4 prolapses, 0.66 per cent.

The author has made use of this method and proposes that the peripheral iridectomy be done before the opening of the lens capsule, instead of after delivery of the lens—as practiced by Hess.

To avoid exciding too large a bit of the iris the author advises using a special iris forceps.

He finds only advantages in the peripheral iridectomy. It is usually covered by the upper lid and so does not interfere with vision. The eye behaves in every respect like an eye in which no iridectomy was done except that the small opening makes the chances of iris prolapse much less.

From Dec. 20, 1905, till June 1, 1910, 200 eyes were so operated upon with only 4 prolapses—0.2 per cent. The advantage is apparent when we compare the 608 cases operated upon in Innsbruch and Graz without iridectomy, where there were 56 prolapses—9.2 per cent. If for any reason a complete iridectomy becomes necessary, the peripheral incision does not in any way interfere with its being done.

Author agrees with Weller that the peripheral iridictomy allows the aqueous to flow freely from the posterior to the anterior chamber and that it is the pressure of this fluid that usually causes prolapse.

Author recommends that cases be carefully selected for this form of operation. E. C. S.

The Method of Simple Extraction of the Lens.—Valk, Francis, New York. (*Med. Record,* Sept. 17, 1910.) The writer gives his experiences with this operation, and recommends the fololwing modification in the corneal section and in the capsulotomy: He uses "a large and rather long Graefe knife, and makes the puncture and counter-puncture about in the horizontal meridian of the cornea so that the upper or cutting edge of the knife will just clear the superior edge of the pupil. The *point* of the knife is then carried rapidly upward and forward, so that one side of the section of the cornea is made by one clean and smooth cut; the knife is now drawn backward and the heel of the blade drawn upward, cutting the other side of the section clean and smooth. The cutting edge of the knife has now reached the superior edge of the cornea, and I now turn the knife on its long axis about one fourth of a circle, and with one clean cut the section is completed wholly within the corneal border. In this way we completely avoid the to and fro movement of the knife, which would give us an irregular cut surface. Our next step is the opening of the capsule, and for some years I did the operation which Herman

Knapp called the peripheral capsulotomy, by which the capsule was divided "from the nasal to the temporal side" behind the iris, near its periphery and parallel to the corneal section. This method I was very much pleased with. But I wanted to carry the section of the capsule all around—in other words, I wanted to make a complete peripheral capsulotomy. This, however, could not be done with the instrument then in use, as the cutting edge of the small knife would injure the pupillary edge of the iris, so I devised the cystotome, described in the *Ophthalmic Record,* August, 1900, page 382. This instrument is a single needle point set at right angles to the shank of the instrument. With this I found I could make a complete circle, with the cystotome carrying the needle point beneath the iris, and about two or three millimeters beyond the pupillary edge. In all cases where this cystotome was used the lens made a rapid and clean exit. If this procedure does separate the center of the anterior capsule of the lens, it should tend to diminish the necessity for the many discissions now performed."

C. H. M.

Removal of the Anterior Capsule in Cataract Extraction.—Kalt, Paris. (*Annales d'Oculistique,* January, 1910.)

Kalt believes that a notable advance in the technic of cataract extraction will occur when the anterior capsule is removed along with the lens, thus permitting easy evacuation of soft cortical and avoiding subsequent capsular thickening. Capsule forceps with teeth are usually imperfect, are liable to tear this delicate membrane without removing it and often catch in the iris. He prefers to use a blunt forceps with crescent-curved blades corresponding to the anterior lens curvature. By slight pressure on the lens a large fold of capsule is removed, even to the zonula. In a few cases the capsule did not yield and the lens came away *in toto,* but this accident was without harm. Satisfactory results have been obtained in more than one hundred cases. Secondary cataract occurs much less frequently and the visual acuity is noticeably higher than by the older technic.

S. L. Z.

The Prevention of Prolapse of the Iris After Cataract Operation Without Iridectomy.—Geis, Franz (*Wien. Klin. Rundschau,* March 6, 1910).

The author's statistics of 170 cases show: 1. That the in-

stillation of 1 per cent. eserin immediately after the extraction of a cataract without iridectomy diminishes considerably the percentage of prolapse of the iris. 2. That the instillation of eserin has no deleterious effects. 3. That diabetes and nephritis are no contra-indications to the use of eserin. J. G.

CASUISTICS.

A Year's Work at the Eye Hospital of the United States Indian School, Phoenix, Arizona.—Martin, Ancil. (*South California Practitioner,* September, 1910.) "Our records show that 75 per cent. of the pupils in attendance at the schools are afflicted with trachoma. The percentage of trachoma cases upon the reservations will probably be found approximately the same. Upon the reservations, however, the damaged eyes are far greater than in the school, for the reason that the percentage of old cases is greater. The operations performed consist of expression, grattage, scarification, iridectomy for visual purposes, operations for entropion." "Case records are being kept of every pupil, normal or otherwise, and also of all reservation or outside cases examined." "Many reservation Indians have presented themselves for treatment, who have been sufferers from trachoma for years, and whose vision has been more or less impaired, in many instances even to total blindness." The benefit derived caused many of the afflicted on the reservations to apply for treatment. A large number who were nearly blind were enabled to become self-supporting. All reservation Indians are kept at the hospital at least 30 days, and then if in good condition are permitted to return to their homes, either to return at stated intervals, or to be treated by the reservation physicians according to written instructions sent out from the hospital. Special precautions are taken as to sanitation and prevention of the spread of the disease. M.D. S.

CHORIOID.

On the Healing of a Solitary Tubercle of the Chorioid. Fleer, Budapest. (*Centralb. f. prakt. Aug.*, 1910, August, p. 230.) Subsidence of a solitary tubercle of the chorioid, either spontaneous or by tuberculin, is extremely rare. F. described such a case in the florid stage in the *Centralblatt für*

Augenheilkunde, September, 1908, which in 1910 was cured and presented to the Society of Hungarian Ophthalmologists. Tuberculin injections, continued for half a year, had no effect. V was reduced to 4/70. The injections were discontinued and the chief stress laid upon good air and nourishment. Half a year later a gradual flattening of the tumor was observed, the miliary nodules disappeared, the borders of the disc became sharply defined, V rose to 5/7. At the site of the affection a white atrophic area of the chorioid and retina of from 2 to 3 diameters of the disc was visible, bordered by a proliferation of pigment, with a corresponding defect of the visual field.

Some authors advocate tuberculin treatment, others surgical interference, but general rules cannot be given. Each case must be individualized. According to E. Fuchs, the prognosis is bad, but sometimes a striking recovery may take place in such eyes which seemed to require enucleation. C. Z.

On "Drüsen" (Verrucosities) of the Chorioid and Senile Changes of the Macula.—Hesse, Robert. (From the eye clinic of Prof. Dimmer in the University of Graz. *Zeitsch. f. Aug.,* xxiv, Sept., 1910, p. 219.) A woman, aged 80, with V. R., 0.4; V. L., 01, showed the following ophthalmoscopic changes which are illustrated by photographs taken with Dimmer's apparatus for photography of the fundus: At the center of each retina was a great number of yellowish white dots covering an area of about 2 papillary diameters, at the border of the fovea a few larger patches, the center of the fovea was dark without reflex.

The general examination gave no clue, urine was free from albumen and sugar.

On her return after 3 years the left macular region was occupied by a yellowish white irregular patch of the size of the disc, with a few smaller ones in the surroundings. Below the macula was a dark red hemorrhage in or before the inner layer, covering a few vessels.

A year later the disc was markedly swollen, pale, vessels very narrow, a small hemorrhage at its upper inner margin. At the macular region a distinctly prominent white focus of 1½ disc diameters was noticed extending midways to the disc. Its upper border lay a little higher than the macula, the lower

corresponded to the lower border of the hemorrhage. A thick blood-vessel coursed from below over the white place and disappeared in it suddenly in the horizontal meridian. A few verrucosities of the chorioid were visible at the periphery.

The first condition described above, consisted in verrucosities of the chorioid with senile changes of the macula, the second in extensive central changes complicated by a hemorrhage and the third was caused by the previous hemorrhage. The coincidence of typical senile changes with typical chorioidal verrucosities was interesting. If the macular changes so deleterious for vision should have developed from the verrucosities, these would lose their assumed harmless character generally. C. Z.

CIRCULATION.

Clinical Studies of the Vessels of the Cornea. — Brueckner, A., Wuerzburg, Abridged Translation from the *Archiv füer Augenheilkunde*, Nov., 1908, by Dr. Matthias Lancton Foster (*Arch. Ophthal.*, Sept., 1910, xxxix, 496). The author gives the results of his investigations in regard to the corneal vessels, dividing his studies into two parts: General Portion and Special Portion. Under the former, he discusses the anatomical relations of the corneal vessels, development of the corneal vessels, and retrogressive metamorphosis of the corneal vessels. Under the second, or special portion, he discusses the superficial lamellar vessels, lamellar vessels in the middle layers of the cornea, and deep lamellar vessels.

In his recapitulation, the author mentions the following points:

"It has not yet been ascertained why in one and the same pathological process in the cornea, vessels develop in one case and not in another. Evidently the condition of irritation at the particular time plays an essential part, as well as in the varying rapidity with which the vessels are formed.

"The appearance of visible movement of the blood in the newly formed corneal vessels indicates the retrogression of the condition of irritation.

"Deep lamellar vessels may be present in the most various diseases of the cornea aside from interstitial keratitis. They occupy a more superficial position in eczematous diseases and

in catarrhal ulcers, while in ulcus serpens they are found, if present, in the deeper and deepest layers of the cornea.

"In fresh eczematous efflorescences characteristic finger or feather-shaped lamellar vessels are sometimes met with which extend partially into the clear cornea.

"A similar ingrowth of lamellar vessels into the clear corneal tissue is sometimes to be met with in iridocyclitis of exogenous or endogenous origin. In the latter case their preponderating or exclusive appearance in the lower periphery of the cornea is to be considered typical. They always run in the deepest layers of the cornea." W. R. M.

Upon the Course of the Vessels in the Neighborhood of a Circumscribed Cupping of the Optic Disc.—Gebb, H. (*Arch. f. Aug.,* xlvii, 2, 3). Formerly it was thought that a circumscribed cupping of the disc was due to a coloboma of the nerve head. Wessely, however, has recently put forward a new hypothesis in explanation of the condition. The vessels of the retina of animal eyes come from the ciliary vessels and Wessely contends that the cup is the remains of the grove or port of entry of those vessels. That the vessels themselves become lost and the cup remains. In short, contends that the condition is one of the atavism.

The presence and course of vessels in the neighborhood must support or combat this view.

The author presents his case in which the vessels near the cup do not run in a way to support the contentions of Wessely. E. C. S.

CONJUNCTIVA.

A New Variety of Conjunctivitis.—Trousseau, Paris. (*Annales d'Oculistique,* January, 1910.) Trousseau describes a peculiar variety of periodic conjunctivitis occurring in June and December, in a female aged 22. As it followed hay fever in the month of May, he suspected a nasal origin, but the examination of the rhinologist excluded this.

The bulbar conjunctiva was always involved, but the palpebral escaped. The attack was preceded by general prodromes such as feverish restlessness, headache, gastro-intestinal disturbances and large cutaneous edemas. These were followed a little later by subconjunctival protrusions that formed as tiny knobbed

elevations, gray or slightly rose colored, each group 2 to 4 mm. high and 4 to 6 mm. wide. They were easily movable over the globe, were not painful on pressure and could be noted through the closed lids. Duration was from 2 to 4 weeks, or longer. After disappearance the mucosa was injected for several days, but soon returned to normal. Has had dry eczema and rheumatism. Both medical and climatic treatment have failed to shorten its course.

Parinaud's conjunctivitis, spring catarrh, tuberculous lesions and parasites were all excluded. The blood test was negative, but the urine showed constant heavy deposits of uric acid. The microscopic examination was elaborate, but revealed nothing definite except leucocytosis with but few polynuclear and mast cells. One must conclude, therefore, that this is a lesion of nutrition rather than of infection. (The reviewer has seen a similar vascular lesion caused by the irritation of a granulomatous growth between the middle turbinate and septum.)

S. L. Z.

CORNEA.

Ribbon-Shaped Opacity of the Cornea in a Girl, Aged 9, and Its Treatment With Subconjunctival Injections of Iodide of Potash.—Ohm, J., Bottrop, I. W. (*Klin. Monatsbl. f. Aug.*, 48, II, August, 1910, p. 243.) In both eyes, which were without irritation and showed no other disease, a horizontal, 2.5 mm. wide, yellowish grey, uniform, avascular opacity extended over the center of the cornea. Its lateral margin was sharply defined and parallel to the limbus, separated from it by a clear zone ½ mm. wide. Under the loupe circular dots could be seen in the opacity which, with different directions of illumination, appeared dark or glaring, i. e., were clear places. A former inflammation of the kneejoint suggested the possibility of tuberculosis, but diagnostic injections of old tuberculin elicited neither local nor general reactions. After 10 subconjunctival injections the more recent central opacities became materially clearer, so that V. R. rose from 4/xxxvi to 4/v and 4/iv, and V. L. from motion of hand to 4/vii and 4/vi. The dense peripheral portions of the opacities remained unaltered.

C. Z.

The Course and Treatment of Ulcus Serpens Corneae. —Schneider, Rudolf (*Wien. Klin. Rundsch.*, June 5, 1910). Whenever ulcus serpens was caused by the diplobacillus of Morax Axenfeld the treatment with zinc sulphate was very efficacious. Other methods of treatment were tried. Gabrielidis and Morax instilled sterile bile and solutions of cholic acids. Phototherapy and bovine serum were also used, but with very little effect. As for curettage with a sharp spoon there are different opinions. Some consider curettage injurious because it may produce infection, others again consider curettage of great benefit in proper cases. G.

Observations on Conical Cornea With the Report of a Case Successfully Operated Upon.—Schwenk, P. N. K., Philadelphia. (*Pennsylvania Medical Journal*, August, 1910.) The writer reviews the literature on all phases of conical cornea. The cause does not seem to be yet clearly known, but it is safe to assume that it is due to atrophic derangement of congenital origin whereby the resistance of the cornea is diminished so that the corneal membranes yield to intraocular pressure. In treatment all means to improve vision by optical measures should first be exhausted before operative interference is resorted to. After a careful study of all operative precedures advocated by many ophthalmic surgeons, the writer in his case decided to use the cautery. The progress of the case is noted in detail. He concludes: "In order to bring about either a good optical or surgical result in a case of conical cornea, it is necessary for the patient to be intelligent, to understand fully the procedure you intend to apply to his case and the expected benefit. If I should again have an opportunity to operate, I would make two or three cauterizations, less in extent, instead of one more severe burn." "That this patient had an unchanged refraction for over two and a half years is sufficient evidence that it is permanent, and bringing his eye from 1/lx vision in a pathological state to 6/ix and quiescent, is sufficient proof to advocate the surgical procedure worthy of considera tion in future cases." M. D. S.

GENERAL DISEASES AND THE EYE.

The Histologic Findings in a Case of Tuberculous Cyclitis, and a Theory as to the Origin of Tuberculous

Scleritis and Keratitis.—Verhoeff, F. H., Boston (*Arch. Ophthal.*, Sept., 1910, xxxix, 433), refers to the usual classification of episcleritis, scleritis, and sclero-keratitis, with nodular formation, into two groups, according to etiology—one group comprising cases of rare occurrence due to syphilis, leprosy, or active tuberculosis, and the other those of frequent occurrence due to some obscure cause, commonly supposed to be rheumatism, and believes the latter condition to be always tubercular. He also points out that no sharp distinction should be made between cases of apparently pure tuberculous keratitis and cases of sclero-keratitis, that they both represent the same type of chronic tuberculosis, and that most often, if not always, tuberculous keratitis has been preceded by scleritis.

In discussing the mode of tubercular infection of the sclera and cornea, the author disagrees with the observations of Stock that tuberculous scleritis is due to extension from a metastatic focus in the uveal tract. He believes that cyclitis is a late occurrence in scleritis and apparently secondary to it. Verhoeff refers to a case of tuberculous scleritis and keratitis and gives the clinical history and pathological examination. From his study of this case he does not believe that the source of infection is through extension from foci in the uveal tract or that the scleritis is due to direct metastases from the blood, but he believes that the infection takes place from the filtration angle.

He concludes as follows: "In tuberculous scleritis (anterior nodular scleritis), the infection reaches the sclera through the filtration angle. The infecting bacilli are derived chiefly from the superficial vessels of the ciliary processes, and are carried in the aqueous humor to the filtration angle. Whether there are always small initial foci on the surface of the ciliary processes, or whether the bacilli, contained probably in phagocytic cells, are exuded through the intact pars ciliaris retinae, is uncertain.

In tuberculous keratitis the infection is also from the aqueous humor, the cornea becoming infected either by metastasis or extension from foci about the filtration angle, or in a similar manner from the foci of a preceding scleritis. In pure tuberculous keratitis, which rarely, if ever, occurs, the infection takes place in the former way only.

Two forms of tuberculous cyclitis are to be distinguished, namely, the interstitial and the superficial (punctate). Interstitial cyclitis is usually secondary to scleritis, and due to the

direct extension of the latter. Superficial cyclitis occurs as direct blood metastases. Clinically, it manifests itself as one of the forms of serous cyclitis.

Superficial tuberculous iritis, involving the posterior surface of the iris, may occur, and is analagous to superficial cyclitis, with which it is probably often associated." W. R. M.

Tuberculosis of the Eye. -Hess, C., Wuerzburg (*Wien. Klin. Rundschau,* Sept. 4, 1910).

Several manifestly tubercular cases with severe irido-cyclitis and large bulky precipitates were improved under the author's care, without specific treatment. In some cases he resorted to iridectomy with a resulting diminution in the inflammatory process and a disappearance of large tubercular nodules. In other cases the inflammatory process increased after the iridectomy.

As the clinical picture of tubercular iritis reacts so differently to different therapeutic measures, it is difficult to determine exactly the value of a specific treatment.

Most oculists consider treatment of a uveal tuberculosis with tuberculin proper. There are a number of cases of tuberculosis of the eye reported in the literature where after treatment with tuberculin the disease was aggravated, and in some cases it led to a loss of the eye.

V. Michel has seen new tuberculous nodules develop in the iris after one injection of tuberculin. J. G.

Molluscum Contagiosum: Report of Ten Family Epidemics and Forty-One Cases in Children.—Knowles, Frank C., Philadelphia. (*N. Y. Med. Journ.,* May 14, 1910.) During the past seven years the writer has seen ten small family epidemics of this affection. He gives statistics of 41 cases embracing sex, age, location of lesions and number of lesions. He points out that children and adults with molluscum contagiosum have not been the only carriers of the disease, but some few of the lower animals have, apparently, been in a few cases the cause of the contagion.

His summary is as follows: "In reviewing the literature on the subject and taking the cases of the author, there seems little doubt but that the disease is contagious. In approximately twenty-five per cent. of the patients, a history of contagion

can be elicited in the direct family, the household, or from intimate friends. Children are more frequently attacked by the disease than adults. In a great majority of the cases the face is attacked, especially in the vicinity of the eyelids, either alone or in combination with other portions of the body. Most cases have but a few lesions. In those cases in which there are a large number of mollusca, the trunk and the extremities are the areas usually attacked, frequently exclusive of the face.

C. H. M.

Retinal Changes in Scurvy.—Kitamura, S. (*Wien. Klin. Rundschau.* March 27, 1910).

Retinal changes in this disease are found mostly at the posterior pole and not in the periphery of the eyeball. The hemorrhages are either punctate or lineal. It is not known positively whether the eye complications are only found in severe cases. There is as a rule a good recovery in most of the cases. J. G.

Keratitis Parenchymatosa, a True Syphilitic Infection.—Igersheimer, J. (*Wien. Klin. Rundschau.* June 12, 1910).

In a fourteen-year-old boy affected with hereditary syphilis and keratitis parenchymatosa, the author was able to demonstrate the presence of spirochoeta pallida in an excised piece of diseased cornea, thus proving that this form of keratitis is a true syphilitic affection. J. G.

Ocular Disease in Hereditary Syphilis.—Risley, S. D., Philadelphia. (*Bulletin American Academy of Medicine,* October, 1910.) The very great importance of these forms of eye disease is shown by the fact that more than 60 per cent. of all cases of iritis are due to syphilis. Two cases are cited, the first a severe case of interstitial keratitis in a girl of sixteen due to hereditary syphilis; the second that of a blind girl of fifteen years, a middle grade imbecile from the same cause. The family history of the latter is interesting as it illustrates the remarkable efficiency of mercury in preventing the birth of syphilitic children. The mother, after having four miscarriages, was placed on continuous treatment, with the result that she gave birth to a living, perfectly healthy child, showing no evidence of inherited disease. Again mercury was administered to both parents and another perfectly healthy child was

born. Supposing themselves cured, the parents neglected treatment. A seventh child was born who when first seen was a puny child, aged eight months, presenting well marked characteristics of a syphilitic, apparently blind in both eyes. After wearing a mercurial bandage for several months, there was great improvement. The left eye had for a time sufficient vision to enable the child to see her way about and to learn her letters on large play blocks. This vision failed until finally she could perceive shadows only. With the deterioration of vision, she became feeble minded and finally sank into a moral degeneracy. "While interstitial keratitis is a frequent form of specific ocular disease and is usually associated with, and probably caused by the impairment of the entire globe produced by an inflammatory affection of the entire uveal tract of the eye, there are numerous instances where the chorioidal disease is present without any involvment of the cornea." "In the negro race especially, who are proverbially syphilitic, the ocular disease manifests itself as a serous iritis, in which the entire uvea is deeply invaded and the nutrition of the eye disturbed. The vitreous body becomes fluid, and the iris glued to the anterior capsule of the lens, the lens becomes cataractous, secondary glaucoma supervenes, and vision is lost. This is one of the most frequent causes of blindness in the colored race."

M. D. S.

On Some Arthritic Ocular Affections.—Oliveres, A., Tortosa, Spain. (*Zeitschr. f. Aug.*, XXIV, September, 1910, p. 226.) Within the last 3 years O. paid especially attention to gout as cause of eye diseases and always found this diathesis in persons who complained of mouches volantes. Perhaps hyperacidity of the ocular fluids may explain their occurrence. Proper nutrition, the use of alkaline water, physical exercise, treatment of affections of the stomach and liver yield admirable results. In 2 obstinate cases subconjunctival injections of benzoate of lithion were very effectual.

Ophthalmic migraine is the second affection which, according to O., undoubtedly has a relation to gout. In 5 cases the symptoms of gout were evident and the good results obtained with antarthritic treatment confirmed this view. The autointoxication in gout overloads the different organs with toxic substances which in the vaso-motor network may under certain

conditions lead to disturbances of circulation in the brain and thus elicit an attack of migraine. C. Z.

Report of a Case of Infectious Optic Neuritis After Rötheln and One After Influenza. Vossius, A., Giessen. (*Beitr. z. Aug.*, Heft 75, p. 252.) A girl, aged 12, was confined to bed for 2 days on account of Roetheln with moderate fever. Since that time she suffered from headaches on the left side and fainting spells. About 2 weeks later she complained of pain and impairment of vision in the left eye, and headache. Choked disc, of from 2.50 to 3.00, was ascertained and a central scotoma for white and colors. She saw only motion of hand. The ocular movements and slight pressure on the closed eye were painful. The right eye was normal. Under mercurial inunctions the affection healed in about 4 weeks, and after 4 months V. was almost normal. The optic disc was clearly defined, its temporal half a little paler.

In the second case, a woman, aged 34, a left-sided relapsing retrobulbar neuritis with acute intense amblyopia and color blindness occurred after influenza. After 1½ months V. was almost 5/v, but the temporal half of the disc was pale. Eight months later V. of left eye was again impaired after another attack of influenza.

Finally, after a new attack of influenza, 3 months later, a fresh retrobulbar neuritis of the right eye developed, which after 1½ months receded with V., 5/iv. Four weeks later pallor of the temporal half of the right optic disc was ascertained. There was no color-blindness of the right eye, but blue was taken for green. At the time of menstruation the patient saw less with the diseased eye than at the intervals.

In this case the retrobulbar neuritis very likely was directly produced by the influenza virus. C. Z.

Two Cases of Primary Syphilitic Affection of the Conjunctiva.—Wolfrum, M., and Stimmel, F. (From the eyeclinic of Prof. H. Sattler in the University of Leipzig. *Zeitschr. f. Aug.*, XXIV, 1910, August, p. 141.) With these, 71 cases have been published, viz., 23 on the ocular conjunctiva, 6 on the semi-lunar fold and caruncle, 11 on the upper, 24 on the lower, retrotarsal fold, 2 not certain from the description.

Hence the eyeball and lower retrotarsal fold are most frequently affected, the semilunar fold and caruncle most rarely.

The mode of infection remains sometimes unknown, but it generally occurred by direct or indirect transmission of contents of the mouth, through kissing, licking, spitting, the fingers or a cigarette moistened with saliva. Mostly physicians and nurses have been infected by amnoitic fluid or genital secretions which squirted into the conjunctival sac.

The prognosis is generally good. In ulcerations the diagnosis can be made from the presence of spirochaete pallida. If there is no loss of substance, the induration, lack of pain, indolent regional swelling of glands are so characteristic, that one can hardly fail to make the diagnosis, especially as the complex of symptoms remains unchanged for quite a while.

Two cases are reported. The first, a girl, aged 20, had a thickening of the semilunar fold to the size of a pea, and of the upper and lower retrotarsal folds with swelling of the preauricular glands. After 3 weeks the submaxillary, cervical and axillary glands were swollen and a universal roseola had developed. The infection originated in the habit of her intended to kiss the patient on the eyes, who had acquired syphilis 1½ years previously and presented a papulo-maculous syphilide on the whole body.

The second case occurred in a nurse, aged 20. The lower retrotarsal fold formed a thickened ridge, devoid of epithelium and covered with a yellowish secretion. No spirochaetae were found. The preauricular glands were swollen. After a few days the tumor was extirpated and the wound dusted with calomel. Wassermann's reaction, 17 days later, was positive. About a month later the patient complained of pain at the chest and upper arms (dolores osteocopi), and beginning interstitial keratitis, which was cured by subcutaneous mercurial injections.

Also in this case the mode of infection could be ascertained. About 6 weeks before the first symptoms developed on the eye the patient attended a man with severe lues, who had a psychosis and discharging papules in the mouth. She remembered exactly the day on which this man in a psychotic attack spit into her face.

The histological structure of the excised piece which exhibited all characteristics of a primary affection, is described in detail.

In the series of sections impregnations of the lymphatic vessels with spirochaetae were found.

W. considers this of a certain practical importance and concludes from this case that the early excision was not able to prevent the general affection, since with invasion of the lymphatic vessels by spirochaetae their general dissemination must be surmised. As the whole conjunctiva of the eyeball and the retrotarsal folds abounds in lymphatic vessels this phenomenon will most likely be repeated in each case of primary localization in the conjunctiva, so that an excision of the primary affection with the purpose of inhibiting thereby the general infection, rather appears unpromising. C. Z.

Optic Neuritis in Luetic Infants. Contribution to the Prognosis and Symptomatology of Hereditary Lues in Infants.—Heine, Ludwig. (From the Children's Hospital of Dr. H. Neumann, Berlin. *Jahrbuch der Kinderheilkunde,* 72 Heft 3, Sept. 1, 1910, p. 328.) Several publications from Dr. Neumann's polyclinic (by Japha, *Deutsche Medizinische Wochenschrift,* 1905, p. 281; Dadt, *Archiv für Kinderheilkunde,* 42, p. 35; Spiro, *Ibidem,* p. 26; Oberwarth, *Jahrbuch der Kinderheilkunde,* 66), emphasized the frequency of optic neuritis in luetic infants. Literature took little notice of it, although Hutchinson (*Ophth. Hosp. Reports,* 1866, p. 307) communicated, as early as 1866, that in the few cases in which he saw a primary neuritis atrophy in the children he always found a syphilitic anamnesis. Hirschberg (*Deutsche Medizinische Wochenschrift,* 1906); Fehr (*Centralblatt für Augenheilkunde,* 1901) and Sauvineau dedscribed the repeated occurrence of primary optic neuritis, while Sidler-Huguenin, in his elaborate paper (*Beitraege zur Augenheilkunde,* 1901) considers an affection of the optic nerve in hereditary lues rare.

For a number of years it has ben customary in the clinic of Dr. Neumann, at the instance of Japha, to examine the eyeground of the majority of the children specifically diseased or suspected of lues.

Out of the 100 cases reported in this article the fundus was examined in 69 infants, 55 of whom had optic neuritis. To these come 36 luetic infants observed in later years, 31 of whom had optic neuritis. Altogether in 86 out of 105 infants, i. e., 81.9 per cent., optic neuritis was found. No other symptom

showed the same frequency. Swelling of the spleen and coryza, the most frequent affections after optic neuritis, were observed only in 75.4 per cent., respectively 73 per cent. of the cases. The diagnosis was made by the ophthalmologists, Dr. Spiro and Dr. Salomon. In 79 out of Heine's 86 cases both eyes were diseased; in 7 one, viz. the left in 6, the right in 1. In 9 cases slight atrophy of the optic nerve was encountered, in 3 the inflammation was complicated by intense congestion. In 7 children also chorioretinitic foci were observed, in one out of 105 infants a severe chorioretinitis without essential participation of the optic nerve. The other parts of the eye were rarely affected; in 3 cases opacities of the vitreous, in 1 iritis, in 1 iritis and keratitis.

Although optic neuritis *per se* has not unconditionally a specific significance, in infants only a syphilitic etiology is to be thought of, if a meningeal or cerebral disease of other nature can be excluded. The diagnostic importance of optic neuritis becomes of special value by the early appearance of this symptom. The youngest child, in which it was observed, was 13 days old. Thirteen infants were younger than 12 months. In several doubtful cases the ophthalmoscopic examination determined the diagnosis of hereditary lues, the optic neuritis deciding the specific nature of other suspicious symptoms. Frequently optic neuritis preceded the other pathological signs, as illustrated by clinical histories.

The prognosis of optic neuritis seems to be favorable in sufficient mercurial treatment, as also emphasized by Hirschberg. But as there was rarely an opportunity for re-examinations, decisive statements on the course of optic neuritis cannot be made. Six out of 9 children re-examined within the first years, were very much improved or cured. In one a partial atrophy was found.

Definite relations of optic neuritis to complications from the nervous system could not be ascertained. C. Z.

GLAUCOMA

The Cause and Pathology of Glaucoma.—Castle, Charles H., Cincinnati (*Lancet-Clinic*, Sept. 24, 1910), mentions difficulties which the general practitioner encounters in recognizing glaucoma by the initial symptoms, and in differen-

tiating it from the migranoid neuralgias. He says that the disease may be considered as the result of "the action of morbid ferments or bacterial toxins derived from the intestinal tract," and enumerates many eye diseases which ophthalmologists attribute to disorders of metabolism or disturbances of digestion. "If one will call to mind the picture of the morbid anatomy of many of the sclerotic and subsequently atrophic processes in the joints, the liver, the kidneys, the ear and the blood-vascular system, he will find that a description of the morbid changes that have taken place in the glaucomatous eyes that have been examined histologically sounds quite familiar." He believes that the continuance of the atrophy of the optic nerve fibers after the relief of the intraocular tension by iridectomy or otherwise shows its resemblance to the other toxic amblyopias. He points out the extreme importance, after having the hyperopia corrected, of attending carefully to the diet, habits, and elimination of the patient. M. D. S.

On Secondary Glaucoma Through Intumescent Senile Cataract and Its Treatment.—Salus, R., (from the eye-clinic of Prof. A. Elschnig in the University of Prag, *Klin. Mon. f. Aug.,* 48, II, August, 1910, p. 167) reports 6 cases which showed the following symptoms: Intumescent cataract, very shallow anterior chamber, more or less acute glaucomatous disturbances; sometimes simple increase of tension, sometimes an incident cause, e. g., instillation of homatropin sufficed to elicit them. The strikingly narrow anterior chamber with transparent or almost transparent lens was never lacking in the other eye, representing a part of the disposition to this kind of secondary glaucoma. The occupation of the patient also seems to furnish a certain disposition. Five of the patients were exposed in their work to intense heat, which accelerates the maturescence of cataract.

In 4 cases primary extraction was performed with good results. This, however, may become complicated for the following reasons: In glaucoma anesthesia is always insufficient; the very shallow anterior chamber, the swollen soft corticalis may complicate the operation, and the danger of the sudden relief of tension must not be underrated; hemorrhages into the vitreous, of the retina, or even expulsive hemorrhages, prolapse

of vitreous. Therefore the diminution of tension must be the first aim.

S. recommends the following treatment: If the tension becomes almost normal by myotics and the anterior chamber deep enough, simple or combined, primary extraction is indicated, the first only if the glaucoma is of brief duration. If the anterior chamber remains shallow and the tension high, posterior sclerotomy with subsequent extraction is absolutely preferable to all other methods of operation; the preservation of a round pupil may thus be insured in suitable cases. C. Z.

The Small Flap Incision for Glaucoma.—Herbert, H., Nottingham, Eng. (Report of the May meeting of the Ophthalm. Soc. of the United Kingdom, *Med. Press*, May 18, 1910.)

Two years ago Mr. Herbert performed a small operation upon eight glaucomatous eyes, which had been described already briefly as a form of subconjunctival paracentesis. By means of a narrow Graefe knife a small rectangular sclero-corneal flap was cut subconjunctivally, with its base at the limbus. This flap might be forced forward a little under the conjunctiva, by the intraocular pressure. And probably it tended to shrink slightly in volume through being deprived of its direct blood-supply for a time. Firm reunion appeared to have been thus prevented. The results up todate were available in six only of the eight cases. One case was a failure owing apparently to adhesion of the iris to the wound. In the remaining cases the tension had been reduced to normal by means of linear filtering cicatrices. In two of the cases, however, the complete reduction of tension had occupied a period of a few months. The leakage of aqueous was at first insufficient. During the last five months Mr. Laws and Mr. Herbert had been operating by means of a similar flap, but broader and hence placed usually above, owing to the possible need of iridectomy, basal or complete, to prevent adhesion of iris to the wound or prolapse. These incisions had been made mostly by means of keratomes and of bent narrow blunt-ended knives. Flaps also 2-3 mm. wide had been utilized in some cases made with the narrow Graefe knife at the outer side of the cornea. It was too early to say more about the results of Mr. Herbert's 14 recent cases than that they were very encouraging. In two cases adhesion

of iris had formed to both limbs of the small section, yet had not interfered appreciably with filtration. Combined iridectomy, peripheral or complete, according to the state of the iris, appeared advisable with the broader incision in cases in which the pupil did not contract well to ersine. It had been performed in three cases only in this series, and secondary iridectomy two days later in one case. By this operation an attempt was made merely to secure with certainty and safety the same linear filtering cicatrix which was sometimes the chance result of an ordinary iridectomy operation. The length and peripheral position of the typical iridectomy incision favored gaping of the wound, and thus tended to produce a filtering scar. In Mr. Herbert's experience a filtering or fistulous cicatrix was the rule after a successful iridectomy, and in itself was sufficient to account for the success. C. H. M.

Three Cases of Acute Glaucoma Treated With Subconjunctival Injections of Sodium Citrate. Heller, Isaac M., New York. (*Ann. Ophthal.*, October, 1910.) The author having been impressed with the report by Drs. Thomas and Fischer of Oakland, California, in the January number of *Annals of Ophthal.* on "The Relief of Glaucoma Through Subconjunctival Injections of Sodium Citrate," tried the method in three cases of very active acute glaucoma. He found the immediate effect was to increase the pain, followed in two hours by pain reduction, a good night's rest and normal tension in twelve hours. The cases all terminated in recovery from practically one subjunctival injection of a 4½ per cent. sol. citrate of sodium. He did not neglect the use of aspirin internally and myotics locally, but does not believe the results obtained were more than augmented by this latter treatment. M. B.

Glaucoma From Adhesion of the Lens Capsule to the Cornea.—Knapp, Arnold (*Arch. Ophthal.*, Sept., 1910, xxxix, 451) discusses the subject of glaucoma, due to adhesions of the lens capsule to the cornea, following traumatism or after cataract extraction. As illustrative of the first or traumatic form, he cites three cases as follows: "I. Traumatic Irideremia. Broad Adhesion of Capsule to Transverse Corneal Wound. Glaucoma. II. Traumatic Irideremia. Broad Adhesion of Capsule to Cornea. Glaucoma. Enucleation. Pathological

Examination. III. Broad Adhesion of Capsule to Cornea. Glaucoma." He also cites the following three cases following cataract extraction: "1. Combined Extraction. Anterior Capsular Adhesion. Glaucoma. Enucleation. Pathological Examination. 2. Combined Extraction. Anterior Capsular Adhesion. Glaucoma. Cyclodialysis. 3. Combined Extraction. Glaucoma from Capsular Adhesion. Cured by Operation."

The cause of the glaucoma was the obliteration of the angle of the anterior chamber by the ciliary processes or iris displaced forward by traction of the capsule adherent to the corneal scar. The total absence of the iris in the first two cases had no effect in counteracting the glaucomatous process, and also showed the uselessness of an iridectomy. The author states that, in the cases following extraction, preventive treatment is most important, and that this condition occurs when the extraction has been performed with iridectomy and is facilitated by certain methods of opening the capsule. He believes that the avoidance of capsular complications is the greatest advantage of the simple operation. The author adds that the treatment after the condition has occurred and the eye is hard, is to divide the adhesion. W. R. M.

INJURIES.

Ring-Form Deposits on the Lens in Contusion of the Eyeball.—Nicolai (*Archiv. für Aug.*, LXVII, 2, 3). In 1903 Vossius first called attention to a ring-formed clouding of the anterior surface of the lens, and Keller reported 6 cases of the condition, occurring with contusion bulbi.

The clinical picture is that, soon after the injury, as soon as the blood in the anterior chamber permits a view, on the anterior surface of the lens there is a circle of faint opacities in the center and corresponding to the pupil edge. This condition is easily overlooked. One should use good illumination and a magnifying glass.

The condition clears usually without leaving any traces or visual defects. It is doubtless due to the pressure of the pupil edge against the lens and there is a certain amount of iris-pigment in the opacity. E. C. S.

Injury to the Lens by a Small Piece of Steel.—Elsetring, A. (*Wiener Klinische Rundschau*, May 8, 1910.)

1. In a case of injury to the lens with a small particle of steel where the point of perforation in the anterior capsule was nearly closed, the capsule of the lens was opened, the foreign body extracted and the transparency of the lens preserved.

2. Steel cataracts are not always hard, they may be soft or liquid in consistency; this has occurred in a case after ½ year's duration. The indications therefore are to perform extraction under the age of 40, with a lancet shaped knife.

J. G.

Pieces of Iron in the Lens Without Formation of Cataract and Their Treatment. Paderstein, R., Berlin (*Klin. Mon. f. Aug.*, 48, II, July, 1910, p. 105), reports a case, in which a large piece of iron of angular form, whose one side was 5 mm. long, the other 4 mm., was lodged for 6 years in the iris and lens without irritation, without formation of cataract or essential damage to the eye, and in which the extraction with forceps was not followed by the development of cataract. Other cases are quoted from literature and the treatment discussed.

P. summarizes his views as follows: 1. Aseptic pieces of iron in the lens generally produce cataract. 2. Exceptionally such foreign bodies heal in the lens without causing cataract, (longest time of observation, 32 years). 3. Exceptionally they are successfully extracted from the clear lens without subsequent cataract. 4. There is no possibility to predict how the lens will react in such a case. 6. If the other eye is normal the attempt of immediate extraction on the path of entrance is indicated, else gradual painless blindness threatens the chances of extraction in due time. 7. If the extraction on the path of entrance does not succeed the attempt with Elschnig's method of extraction in 2 sittings through a peripheral discission wound is indicated. 8. If the foreign body is lodged in the transparent lens of the better eye, the function of the other eye being deteriorated, waiting is without danger and justified.

C. Z.

An Enormously Large Piece of Iron in the Eye. Koerber, Marxloh. (*Centralbl. f. prakt., Aug.*, 1910, August, p. 231). The left eye of a man was struck by a piece of an iron

pin making a vertical wound from the upper limbus through the whole cornea to the lower limbus a little ways into the sclera. The cornea and the eyeball were collapsed. As soon as Hirschberg's hand magnet was approached to the wound an enormous piece of iron rushed forward with vitreous and chorioid. Then the patient consented to evisceration which was immediately performed. The piece was 7.5 mm. long, 12 mm. wide, and 5.5 mm. thick, and weighed 3.15 gram., perhaps the largest ever observed. C. Z.

Traumatic Enophthalmais.—Sautter, A. C., Philadelphia. (*Ann. Ophthal.,* Oct., 1910). A young man while playing baseball was struck by a foul ball in the right frontotemporal region, causing skin wounds above and below the eye and great swelling of the eyelids and subconjunctival hemorrhage. Some six weeks after the injury the eyeball was found to be 6 mm. more deeply seated in the orbit than its fellow. The palpebral fissure was narrowed from drooping of the upper lid. There was also some muscular failure to rotate the globe in its complete excursions. The vision was reduced to 15/c in the lower field. Diplopia upon looking upward. Cornea clear, pupil dilated and reactions sluggish. Ophthalmoscope showed clear media except for a few fine spicules in the lens. Retinal vessels of normal size. Just below and between macula and disc there was a triangular-shaped patch of old retinochorioiditis with moderate pigmentation. The results of an X-ray examination show fractures had occurred involving the right zygomatic process, the external orbital margin, the inferior orbital margin and probably the floor of the orbit, also the nasal orbital wall, including the adjacent ethmoidal sinuses and possibly the frontal sinus. The author attributes the enophthalmus in this case primarily to a rupture of the check ligaments or of the supporting sheath of Tenon's capsule, or to a relaxation of these ligaments due to fracture of their bony attachments; secondarily to the development of cicatricial tissue resulting from the laceration of the soft structures within the orbit. M. B.

Penetrating Wound of the Globe by a Whip Lash.—Creste. Naples. (*Annales d'Oculistique,* January, 1910.) Two dangers confront us, rupture of the sclerotica and the introduction of pathogenic bacteria into the wound, either directly

from the lash, or from the conjunctival secretions. This is the first case of this accident reported since the one related by Vigier. Rembinger found many varieties of aerobic and anaerobic bacteria on the whip lash, which he noted was sometimes dragged on the ground by the cabmen and frequently wet in their mouths. Oreste believes that the severe panophthalmitis occurring in the case he relates was probably due to infection by the bacillus perfringens, associated with the bacillus subtilis. S. L. Z.

A Rare Case of Foreign Body in the Eye.—Lanier, L. Herbert, Kansas City, Mo. (*The Medical Brief*, Oct., 1910.) Patient, male, age 34, French. He gave a history of foreign body entering the eye twenty-two years before. Six months later a partial enucleation was done and afterward an artificial eye was worn. Pain, discomfort and considerable irritation had always been experienced. The artificial eye had been discarded nine months before consulting the writer. At this time there was a violent inflammation of all the remaining part of the eye and initial symptoms of sympathetic ophthalmia. The patient consented to an operation and a piece of metal apparently tin, ¾ of an inch in length and ⅜ of an inch in width was dissected out. It was completely encysted, and situated obliquely in the orbit, with the posterior end near the origin of the internal recti muscle. The symptoms of sympathtic ophthalmia subsided in a few hours. M. D. S.

A Case of Retro-Ocular Neuritis Caused by Suntraumatism.—Shorten, Lieut. J. H., I. M. S. (*Indian Medical Gazette*, June, 1910), relates the case of a native soldier who, after carrying grass on his head in the sun, temp. 85° F., suddenly fell down and became unconscious. The pupils were dilated and sluggish, conjunctivae injected. In four hours he had practically recovered except for dimness of sight. There was nonction of sight to p. e. pair on opening or moving the eyes and there was conjugate deviation to the left. He saw spots and flashes of light. Later his discs were found hazy in outline and woolly. Fields contracted in all directions. Under treatment with blisters and potassium iodide (up to 30 grains, 4 d. c.) he gradually recovered. The discs remained anaemic and he could not see well in a bright light long afterward.

F. P. M.

A Case of Imperfect Evulsion of the Optic Nerve by the Kick of a Horse.—Pichler, A., Klagenfurt (*Klin. Mon. f. Aug.*, 48, II, p. 246), describes the ophthalmoscopic condition of the left eye of a man, aged 53, who at the age of 18 was kicked by a horse on the left cheek, below the eye, with instantanous blindness in this eye. The pupil was of the same size as the right, but showed amaurotic immobility. The lens was transparent. At the site of the optic disc was a vertical oval, of about the size of the disc, partly covered by a fine cavernous network of fibers with deposits of much irregularly shaped black pigment. From the lower half of the disc a grey band projected into the vitreous ending into a firm tuft. Above this sprang from the center of a disc two bloodvessels, of the appearance of retinal veins, towards the upper and outer parts of the fundus. A white uneven ring, of the aspect of the sclera, surrounded the disc, and contained numerous blood vessels. It showed, a refraction of 4.00, the disc emmetropia, the macula+I. From the network on the disc numerous pigmented stripes ran over the ring to its outer border.

P. considers the oval as the disc placed in a slanting position by the traumatism. and the ring as the inner wall of the dural sheath. The enophthalmos apparently was due to a fracture of the lower and medial orbital walls.

The injury of the eye occurred in such a manner, that the hoof entered the orbit from below like a wedge and forced the eyeball forward. The preservation of the 2 upper papillary vessels indicated that the evulsion was incomplete. The displacement of the disc backwards was slight, also the formation of connective tissue, which in numerous other cases was very abundant. C. Z.

A Case of Retrobulbar Inflammation from a Foreign Body. Recovery.—Fejer, J., Budapest. (*Centralbl. f. prakt. Aug.*, 1910. August, p. 228.) A week ago a boy, aged 13, was stabbed by a friend in the right eye. The wound at the right side of the root of the nose and below the inner portion of the supra-orbital margin was sewed in a nearby hospital. The lids were very much swollen, conjunctiva chemotic, eyeball protruded, its movement restricted. The pupil was wide, without reaction, optic disc swollen, its borders indistinct, blood vessels engorged and tortuous. V. 5/xv? As the symptoms

were aggravated the next day, the wound was opened, and pus evacuated. The wound was drained with stripes of gauze, but the edema, protrusion, chemosis, pain became more intense, fever and vomiting set in, in short, symptoms of meningeal irritation which endangered the life of the patient. A renewed opening of the wound did not improve the condition, so that enucleation was contemplated. On that day, however, a piece of a penholder, 6 mm. long and 5 mm. wide, was washed out by irrigation of the wound canal, followed by a speedy recovery. A slight degree of exophthalmos persisted, very likely from the retrobulbar venous congestion and formation of scars. These were favorably influenced by injections of fibrolysin.

C. Z.

Transient Cortical Amaurosis by Commotion of the Brain.—Hirsch, Camill, Prag. (*Deut. Med. Woch.*, 1910, No. 31, p. 1436.) A boy, aged 12, was run over by an automobile and was picked up unconscious and brought to a near hospital. A wound, 8 cm. long, was found at the occipital protuberance, and the patient complained that he could not see anything. There was not the slightest perception of light, pupils somewhat more than medium sized, reacted sluggishly to light, motility and fundus were normal. After 3 hours large objects were recognized, and after 4 further hours fingers counted near by, but there was right-sided homonymous hemianopsia and symptoms of amnesic aphasia. The next day the visual field extended over the median line into the hemianopic half. Retrograde amnesia was ascertained, as the remembrance of the accident lacked entirely. On the 3rd day vision and visual field were perfectly normal. The amnesia lasted a few days longer but disappeared completely.

H. attributes the transient cortical amaurosis to commotion of the brain, which, from the symptoms, was beyond question: unconsciousness for a few minutes, pallor of face, sluggish reaction of the pupils, marked retrograde amnesia, lower temperature at the beginning, irregularity of the, at first retarded, then transiently accelerated, pulse, the sudden onset of all symptoms at the moment of the traumatism, then the gradual subsidence in a short time and complete recovery. C. Z.

INSTRUMENTS AND METHODS OF EXAMINATION.

A Modification of the Tattooing Instrument.—Ohm, John, Bottrop (*Centralblatt für prakt. Aug.,* 1910, September, p. 267), replaced the knob of the electric instrument of Piesbergen (described in Centralblatt für Augenheilkunde, 1899, p. 36) for vibration massage of the eye, by a bundle of 2 or 4 needles. The instrument makes 2000 oscillations in one minute. It is very handy and performs the tattooing easily, rapidly and accurately. C. Z.

Tests for Color Vision. Taylor, G. H. (*Australasian Medical Gazette,* May 20, 1910.) Medical officer for N. S. W. Railways, Sydney, states that the color testing on his railways is by Holmgren's wools and a modifications of William's lantern. The re-testing of men for color vision on the running lines is by William's lantern alone. The old lantern he objects to as one with defective color can learn it. In his new lantern any contrast color or any single disc can be brought into view and not in regular sequence. For confirmation Nagel's test is used. Dr. Taylor thinks the conflict of opinion that occasionally occurs in different examinations of a candidate by Holmgren's wools is due in a great majority of cases to atmospherical conditions. In an unsatisfactory light a man with a feeble color sense may fail in his green test and satisfy the examiner under more favorable conditions of light. Prior to the adoption of the modified lantern 0.42 per cent. with defective color sense not detected by Holmgren's test were discovered by the old lantern. The new lantern increased that percentage by 0.7 per cnt.

F. P. M.

IRITIS.

The Objective Diagnosis of Iritis. Ball, James Moores, St. Louis. (*Oklahoma Medical News Journal,* Sept., 1910.) Differentiation is made between iritis and acute catarrhal conjunctivitis, between iritis and glaucoma, and between irits and cyclitis. Iritis is discussed under the headings: serous, plastic, and parenchymatous. Plastic iritis is the type most frequently encountered, syphilis or rheumatism being its chief causes. Parenchymatous iritis is divided into suppurative, gummatous and tubercular forms. As causes of suppurative iritis,

diabetes and acute infectious diseases such as pneumonia, cerebro-spinal fever, influenza, etc., are named. It also occurs from embolism in puerperal septicemia and pyemia. Tubercular iritis is secondary to a tubercular focus located in another part of the body, and is found principally in persons under twenty years of age. In those forms of iritis, small, gray, transparent nodules are seen, which slowly change, some disappearing while others form. The disease is often bilateral. Recovery may take place, but it is generally complicated by tubercular iridocyclitis. M. D. S.

LACRIMAL APPARATUS.

The Lacrimal Duct as a Portal of Infection in Blennorrhoea Neonatorum, and Its Prevention.—Phillips, William Linton, Buffalo. (*N. Y. Med. Journ.*, July 23, 1910.) The writer believes that the minimum proportion of foetel infection of eyes is caused by direct germ contact, and the maximum amount of infection travels indirectly by way of the nose, a cavity which remains open and would naturally become filled, at the time of the rotary motion of the head through the pelvis, with septic material which is drawn further back by the first breath filling all nasal openings with infection. He considers three ways by which infecton travels from the nose to the eyes: 1. Blood vessels and lymphatics, 2. by way of antrum and frontal sinus, and 3. the lacrimal canal; the last being the most direct is considered the principal way.

He cites an instance of erysipelas at the nasolabial junction in a child in which the disease spread along the nasolacrimal duct producing a dacryocystitis without involving any part of the fact except at the original point of infection.

He advises that obstetricians should immediately cleanse the nose in order to prevent blennorrhoea neonatorum; he recommends disuccinic peroxide as the most suitable agent for this purpose used 1:500 to 1:30 to offset tear dilution; this remedy can be used by medicine dropper or by atomizer, the head of the child being tipped forward so that the fluid will flow out of the nose rather than into the throat and Eustachian tubes. When there is a history of a vaginal discharge before birth the nose should be cleansed several times a day, but with no dis-

charge daily spraying is sufficient if continued beyond the incubation period.

In addition he recommends that the mouth should likewise receive care and the lacrimal ducts massaged gently toward the eye in order to force out any septic material after which disuccinic peroxide, 1 in 250, or some other powerful antiseptic should be freely dropped into the eye. If necessary this treatment may be used for weeks without injury. C. H. M.

MATERIA MEDICA AND THERAPEUTICS.

Naftalan in External Diseases of the Eye.—Vogt, A., Aarau. (*Klin. Mon. f. Aug.*, 48, II, August, 1910, p. 242.) Naftalan is a greyish black oily substance, consisting of partly saponated carbohydrates of Caucasic petrol, used since olden times by the Tartars as a remedy for rheumatic skin diseases, etc. It is soluble in ether and fat, not in water. V. used a prescription of Prof. Massini, Basel: Naftalan 20.00, Zinc oxide 10.00, Amylum 10.00, with excellent results in catarrhal ectropium with secreting inflammation of the borders and skin of the lids and eczematous infiltrations of the conjunctiva and cornea. In scrophulous affections of the cornea 0.3 to 0.5 Naftalan with 10.00 Vaseline is recommended. C. Z.

Dionin in Corneal Opacities.—Brown, Samuel Horton, Phila. (*Amer. Journ. of Ophth.*, June, 1910). The writer records the history of a patient in which a gratifying effect resulted from the use of dionin after a long period of markedly reduced vision and illustrating the necessity of persistence in the treatment of individual cases. The patient was a young woman of 28, who had had some corneal trouble 18 years before, causing pronounced, superficial opacities. The right eye presented the greater opacity and after ten days, during which a five per cent solution of dionin has been instilled twice daily, the vision was 5/22.5; after a month, 5/xii; the drug was discontinued and after another month vision in the right eye was 5/ix ? and has remained so ever since. In the left eye the vision rose from 5/lxv to 5/ix ? following one month's treatment with dionin. C. H. M.

The Effect of Dionin on the Eye.—Adam (*Wien. Med. Woch.*, July 30, 1910).

Dionin relieves pain in diseases of the anterior portions of the eyeballs, especially in superficial abrasions of the cornea and in affections of the sclera. Its effect as a resorbent in cases of macula cornea was not very evident. In glaucoma the drug produces a dilatation of the pupil without increasing the tension in the eye. In iridocyclitis 2 per cent. dionin ointment is, at times, of no effect whatever, whereas if used in the form of a powder, it aids the action of atropin. J. G.

Six Cases of Hypopyon Keratitis Treated by Local Applications of Pyocyanase.—Bronner, A., Bradford, Eng. (Report of the May meeting of the Ophthalm. Soc. of the United Kingdom; *Med. Press,* May 18, 1910.)

Many cases of ulceration of the cornea, especially in elderly people, were most difficult to cure, and often ended in complete destruction of the cornea. In some recent cases Dr. Bronner had applied 50 per cent. pyocyanase eye drops every hour. In every case the pain had disappeared in a day or two, and the ulcer had healed up more quickly and with less consequent opacity of the cornea than under the ordinary method of treatment (galvano-cautery, carbolic acid, subconjunctival injections). Of course atropine drops and hot fomentations were also used. Pyocyanase was a brownish fluid prepared from broth cultures of the bacillus pyocyaneus, as suggested by Emmerich and Lowe, by the Institute of Bacterio-therapeutics, at Dresden. C. H. M.

Cuprum Citricum Solution "Kusol" and Its Use in Eye and Skin Affections.—Arlt, v. Ferd. Vienna (*Wien. Klin. Rundschau,* March 20, 1910).

Cuprum citricum is not easily soluble in water. If sodium chloride and borocitrate of soda from 1.2 to 3 per cent. is added to the solution, it is possible to produce a solution of 1.333. There are three forms of kusol: (1) Kusolcollyrium, (2) Kusol ointment and (3) Kusol powder. Two drops of a 1-3 per cent. solution of kusolcollyrium instilled into the eye three times a day produces neither irritation nor pain. This drug is indicated in trachoma of recent origin, in trachoma with scar tissue and in follicular conjunctivitis. It is also used in gonorrhœa. J. G.

A Case of Gonorrheal Conjunctivitis in an Adult Aborted by Two Per Cent. Nitrate of Silver.—Claiborne, J. Herbert, New York City (*American Medicine,* August, 1910), cites a case seen 10 or 12 hours after the first symptoms of the disease had appeared. The attack was very severe, but contrary to the usual text-book instructions, two per cent. silver nitrate solution was used in this early stage after washing the eye thoroughly with a 1-3000 bichloride solution. The entire conjunctival sac was filled with silver nitrate solution which remained in fifteen seconds, being then washed out with normal saline solution. Atropine was instilled and ice pads changed every three minutes. The corners of the eye and eyelashes were kept free from pus by the nurse. She instilled the bichloride solution every two hours, pulling down the lower lid, not touching the upper. The trouble started in the other eye 12 hours later and the same treatment was used. By the fifth day the discharge had ceased entirely in both eyes. In ten days the eyes were almost perfectly white and the patient thoroughly comfortable.

M. D. S.

A Case of Twitching of the Orbicularis Palpebrarum Successfully Treated With Calcium Chloride.—Burness, Theo. C., Berkeley, California. (*California State Journ. of Medicine,* Oct., 1910.) Miss G., a student in the University, complained of a persistent twitching of the lower eyelid on the left side which had lasted for several months and was very annoying. A rhythmical twitching of the lower segment of the orbicularis was plainly visible. No error of refraction was discovered. She was put on 0.3 gm. of calcium chloride three times daily. She took the remedy for something like two weeks and was advised to stop on account of its bad taste and irritant action. She was then decidedly better, but there was still some twitching. The salt was discontinued, however, the improvement went on slowly and the twitching ceased a few days afterward. Five months later there had been no return. The continued improvement after she had ceased taking the calcium may be due to the fact that the salt is slowly absorbed and slowly excreted, its action being probably cumulative. The writer reviews briefly the literature relating to the therapeutic uses of the calcium salts. M. D. S.

Disinfection of the Skin With Tincture of Iodine Before Eye Operations.—Segelken, H., Stendal (*Klin. Mon. f. Aug.,* 48, II, July, 1910, p. 113), gives a review of literature on the new method of sterilization of the skin in operations with tincture of iodine, devised by A. Grossich, and reports on his results obtained with it on 75 eye operations of different kinds and 5 perforating injuries of the cornea and sclera. The skin of the lids, not previously cleansed, was painted with ordinary tincture of iodine to an extent of from 2 to 3 cm. from the anterior edge until the skin showed a brown coloration. After the operation the eye was covered with a sterile bandage. In a case of discission the place of puncture of the ocular conjunctiva was directly touched with tincture of iodine without previous cleansing of the conjunctival sac with salt solution.

A disturbance of the wound or any other complication was never observed, excepting erythema or more or less edema of the skin of the lids, which in no way deteriorated the clinical result. S. recommends this method for extensive application in eye operations as it simplifies and apparently promotes disinfection. In his last 10 operations he used diluted tincture of iodine (5 per cent.). C. Z.

On Subconjunctival Injections of Fibrolysin.—Ollendorf, A., Esslingen. (*Zeitschr. f. Aug.,* XXIV, 1910, July, p. 30.) A man, aged 18, who had erysipelas of the face 1½ years ago, acquired an affection of the lungs, followed by gradual impairment of both eyes. The posterior surface of the cornea showed fine deposits, the vitreous was filled with floating membranous opacities, so that the fundus could not be seen. In the left eye was a posterior synechia. V. changed from fingers at 2 mm. to 5/xxxvi, according to the position of the opacities. The treatment consisted in atropin, diaphoresis and iodide of potash. The apex of the left lung was infiltrated and the patient reacted very intensely to a probatory injection of 0.5 old tuberculin, also on the eyes with ciliary injection. Treatment with 0.0025 mgr. was always followed by ciliary injection and several times by posterior synechiae, so that it was discontinued. Subconjunctival injections of 2 per cent. salt solutions had no effect.

After 3 months the tuberculin injections were resumed and

the poorer right eye treated with subconjunctival injections of fibrolysin from 0.3 to 0.6, at intervals of from 4 to 10 days. After 5 injections this eye became considerably clearer, and after 11 injections of fibrolysin the opacities of the vitreous had grown so much less and thinner that the fundus could be seen and V. rose from 5/xxxvi to 5/xviii, while the other eye remained unchanged. Then both eyes were injected, with the result that the eyes were without irritation, without posterior precipitates on the cornea, and without synechiae.

The undoubted favorable effect of fibrolysin in this case invites to its application in otherwise incurable diseases, especially detachment of the retina caused by shrinking and strands of vitreous. The injections are at first painful, but may perhaps be made less so by a previous subconjunctival injection of a 2 per cent. solution of cocain. C. Z.

Results With Wassermann's Reaction in Eye Patients. —Fleischer, B. (From the eyeclinic in the University of Tuebingen. *Klin. Mon. f. Aug.,* 48, II, August, 1910, p. 230.) Wassermann's reaction was applied in all cases which were suspected of lues or in which lues might come into consideration, in some for certain exclusion in the differential diagnosis; 273 in all; 88, i. e. 32.5 per cent., were positive; 181, i. e. 66 per cent., negative; 6, i. e. 1½ per cent., doubtful. Lues could be diagnosed from the history or other general symptoms in 33 cases, i. e. 44 per cent., or scarcely one-half of the positive cases, and 12 per cent. of all cases examined. The different affections are tabulated.

Of special importance were the diseases of the cornea, particularly parenchymatous keratitis. Forty-six such cases were examined, 40 with positive reaction, 2 not certain, 4 negative. One of the negative and one of the uncertain had been treated for some time with mercury, and 2 of the negative reaction had other symptoms which rendered lues probable. Thus a higher percentage, up to 95 per cent., may be assumed for parenchymatous keratitis, which must be considered of predominant luetic etiology.

All 6 cases of acute serous iritis were negative. Out of 17 cases of acute plastic exudation iritis, 4 were positive, in 3 tuberculosis, in 3 rheumatic diathesis were diagnosed, in 7 the etiological diagnosis remained open. Out of 4 cases of

iritis in children 1 was positive, 1 tuberculous, 2 uncertain. Out of 33 cases of chronic iritis 9 were positive, 6 of which showed no other symptoms of lues. Out of the 24 negative cases tuberculosis was diagnosed in 6, in 16 the etiology was undetermined, in 2 lues seemed probable. Out of 30 cases of chronic iridocyclitis with severe complications (opacities of vitreous, cataract, chorioidal changes, etc.), 6 were positive which exhibited no other signs of lues; of the 24 negative tuberculosis was diagnosed in 6, rheumatism in 2, lues was probable in 2, in 13 no diagnosis was made.

Of all 66 cases of chronic iritis 15 cases were positive, of all 90 cases of iritis 20, i. e. the same percentage, viz. somewhat more than 20 per cent. This is not much higher than formerly supposed, which corroborates F.'s opinion, that in that region the tuberculous diseases are in the majority.

Out of 12 cases of disseminated chorioiditis 2 were positive. Two of central chorioiditis and 2 cases of peripheral chorioiditis were positive. Out of 12 cases of chorioretinitic changes (fine pigment foci of the well known character of luetic alterations) 7 were positive.

One case of typical retinitis pigmentosa with ringshaped scotoma was positive, 3 negative. Six cases of amaurosis in children without ophthalmoscopic changes were negative, in one of which the reaction of the mother was positive.

Out of 7 cases of reflex iridoplegia 2 were positive, 4 negative. One case of inflammatory glaucoma with retinal hemorrhages was positive. Hence it seems indicated to examine a larger number of cases of glaucoma.

F. concludes from these experiences: Wassermann's reaction represents a very important new diagnostic aid for ophthalmology. Our experiences as to the value of some symptoms have been materially promoted by it. The reaction in the individual case is an indispensable means for the etiological diagnosis. C. Z.

The Practical Importance of the Reaction of Wassermann-Neisser-Bruck for Ophthalmology.—Eschlepp, Oskar (From the New General Hospital at Hamburg-Eppendorf. *Arch. f. Aug.*, 66, p. 378) reports in detail on 60 eye cases, in 30 of which the blood reacted positively. He concludes that in lues I of the eye W. R. may be a valuable help

in differential diagnosis. A positive reaction may be expected only in from 55 to 71 per cent., as otherwise in primary affections, in recent luetic inflammatory changes of the eye which have not been treated, corresponding to manifest symptoms in lues II and III, in from 80 to 97 per cent., in luetic inflammations, that have run their course, corresponding to latent syphilis, in from 30 to 50 per cent., in hereditary luetic eye diseases in from 80 to 100 per cent. Ocular symptoms from central causes in tabes, progressive paresis, cerebro-spinal lues will give the percentage of positive reactions as found in these diseases: Tabes 56 to 50 per cent., paresis about 100 per cent., cerebro-spinal lues about 100 per cent. The examination of spinal liquor, which in these diseases is of great differential diagnostic value, cannot be ignored by the ophthalmologist who frequently sees their initial stages.

A positive reaction proves only that there is lues, not that there is lues of the eye. This conclusion is justified after excluding all other etiological factors, especially tuberculosis.

C. Z.

The Treatment of Syphilis With Ehrlich's "606."—Nichols, Henry J. and Fordyce, John A. (*Journ. A. M. A.*, Oct. 1, 1910.) The object of experimental chemotherapy is the preparation and discovery of drugs which shall possess specific powers over given parasitic micro-organisms. To use Ehrlich's terminology, it was necessary to seek drugs which were on the one hand highly parasitotropic, and on the other were quite devoid of organotropic activities. In the course of his quest, Ehrlich has had the good fortune to produce a number of drugs which more or less fulfilled these ideal conditions, but recently the quest has been crowned with an extraordinary achievement that promises to be of the greatest importance in the treatment of syphilis and hence of incalculable benefit to the human race. The conquest of animal parasites must be attempted by means of ordinary chemical substances, compounds which exhibit a higher degree of poisonous effect on the parasite than on the host.

The substance atoxyl, which is an empirical arsenical compound, came into use in the treatment of sleeping sickness, for which it proved a highly useful although not invariably successful drug. Fortunately, the discovery of the transmissibil-

ity of syphilis to the lower animals and treponema pallidum, the parasitic cause of syphilis, came to be achieved about this time. Hence the new drugs could be tested not only against fowl spirilla and the spiral organisms of relapsing fever, but also against treponema pallidum in infected rabbits. In due preparation No. "606" came thus to be tested, and was proved to be efficient in a single dose, which, while it sufficed to destroy all the parasites, was without perceptible injurious effects on the host. In all but a few exceptional instances a single dose of the drug has sufficed to bring about a rapid disappearance of the lesions of syphilis and equally rapid improvement in the general condition of the patients. It is noteworthy that in many instances the patients who have improved rapidly after an injection of this drug had resisted the application of mercury sometimes over many months, or possessed idiosyncrasies which made the use of mercury difficult or impossible.

The substance is a yellowish powder which rapidly oxidizes on exposure to air, and is therefore put up in vacuum tubes. According to this method, the drug, in a dose which has varied up to the present from 0.3 to 0.6 grams, is dissolved in a mortar in 1 to 2 c. c. of ordinary solution of sodium hydrate. It often happens that there is slight pain lasting a few minutes following the injection, and in some instances a slight swelling arises on the second or third day following the injection, but no bad effects are produced. There may be slight rise of temperature and in some instances an urticarial eruption has occurred, but no specific toxic effects on the eyes, kidneys, or nervous system have been observed.

It is probable that the drug will come to be extensively used throughout the United States. Twelve patients received the full dose intended, and included examples of primary, secondary, and tertiary lesions. The effects were in these instances truly remarkable and now, from three to four months after the injections relapses have not been observed to occur. Before the treatment the serum reactions were all positive and at the expiration of the time mentioned, in all the patients who could be traced, they have become negative. Aside from the temporary local disturbance caused by the injection in some instances, no untoward symptoms were observed, except an urticarial eruption in two of the cases. None of the patients received more than 0.3 gram, which is about one-half of the

dose now being employed abroad. Hence, it would not be surprising if in this first group relapses occurred. If so, it would be both safe and desirable that a second and larger injection be given.

Hata has permanently cured all rabbits having spirochetal lesions by means of a single dose of an adequate size. We have found that when the dose is too small, relapses occur in the infected rabbits.

Personal experience in the treatment of syphilis has convinced us that mercury given in the early stages in as large doses as the system will tolerate insures the patient more certainly against relapses. Professor Ehrlich's contention, therefore, as to the value of a drug which at one dose destroys the invading organism is supported by clinical experience in the use of mercury. Delay or insufficiency in the amount of mercury at this time permits the entire system to become infected by the treponema pallidum and damage to the blood-vessels or important structures takes place which might be prevented by energetic treatment. The great advance made in controlling the treatment by the Wassermann reaction cannot be too strongly emphasized, showing as it does that in the past some patients may have been greatly over-treated, while the majority have received too little of the specific drugs.

When Dr. Flexner, of the Rockefeller Institute, in the early part of May, this year, received a supply of the new preparation, "606," and asked to be allowed to try it in a number of selected cases in the City Hospital, the proposition was received with favor and the patients in the skin and venereal wards were placed at his disposal. The rapid action of arsenobenzol in cases of obstinate syphilis of the palms is strikingly illustrated. In the case of multiple initial lesions of the lip of two months duration, with secondary manifestations of the skin, complete resolution of the chancres took place within about ten days, leaving practically no evidence of their former existence. A rather malignant form of eruption which occurred less than one year after infection is illustrated. One case was of rapidly progressing optic neuritis with tabetic symptoms, the result of a specific infection twenty years before. In the case of cerebral syphilis an improvement took place in some of the symptoms which mercury and medication had failed to influence.

The question of danger in the use of the new drug is one that should be touched on. It would be a marvel should a drug so potent as this one in the destruction of living parasites within the body be wholly devoid of injurious or secondary effects on the organs. The remarkable fact about "606" is that in the several thousand cases in which it has already been employed, and considering the wretched physical state in which many of the patients were at the time of the injection, so very few untoward effects have occurred. It is now clear that the mode of administration is important, and especially the elimination of the methyl alcohol used at an early period to dissolve the drug, since this drug may produce unpleasant if temporary symptoms. Further experience with the drug will determine with more accuracy the dose which is necessary to bring about a cure, the time that must elapse before a second dose can be safely given and the more definite indications for its use after relapses or failure of a single dose to control the symptoms. H. V. W.

Concerning the Treatment of Various Forms of Ocular Tuberculosis and of Corneal Infection With Vaccines or Bacterins.—De Schweinitz, G. E. (*Therapeutic Gazette* [A clinical lecture in the School of Medicine of the University of Pennsylvania], October 15, 1910) presents first a case of tuberculous sclero-karatitis of the right eye in a girl of eighteen. She gave a history of two previous attacks of inflammation in this eye. When first seen, "The vision of the right eye amounted to counting fingers at 30 centimeters. The cornea was occupied by a number of patchy, white infiltrations, some of which were superficially placed." "Across the cornea, especially above and to the inner and outer sides, there was a moderate ingrowth of vessels. The entire sclera exhibited a deep injection of a bluish-red or violaceous tint, and the episcleral tissue was tumid and edematous, so that it presented a somewhat gelatinous appearance, and throughout it were numerous pinhead-sized yellowish nodules. The iris was with difficulty seen on account of the corneal opacities, but it was evidently discolored, and the remnants of former synechiae, as well as uveal pigment on the capsule of the lens, were visible. The left eye was normal in appearance." Old tuberculin injections were given daily for ten

days, then at less frequent intervals for six weeks longer. At the end of two and one-half months the eye was absolutely white and quiet; vision, 6/lx. Boric acid irrigations and scopolamine hydrobromide were also used. Another similar case not responding to the ordinary line of treatment was treated with tuberculin. A moderate reaction followed each injection and a cure seemed in sight, but a redevelopment of the symptoms occurred. He recommends that when satisfied that an ocular lesion is tuberculous in origin, an active tuberculin, beginning with a small initial dose, should be used. The dosage should be sufficiently guarded to avoid signs of reaction. A case of infected ulcer of the cornea with hypopyon due to the *streptococcus mucosus* was treated with a bacterin prepared from a culture of *streptococcus mucosus* obtained from the ulcer. Three injections were given, the first containing 50,000,000 cocci; the second, five days later, 100,000,000 cocci, and the third, four days later, again 100,000,000 cocci, distinct improvement showing after the first injection. Ordinary procedures, as Saemisch's incision, etc., were used, but the improvement was much more rapid than is ordinarily seen in a sloughing ulcer. Another patient with gonorrheal iritis was treated for nine days by the usual methods with no relief. After the use of Neisser bacterin improvement was marked. In three weeks the patient was discharged cured. The cases above are each fully described. M. D. S.

The Treatment of Some Corneal Ulcers by Zinc Ions. —Jones, H. Lewis, London. (*Brit. Med. Journ.*, Aug. 27, 1910.) The writer gives the histories of four cases illustrating the value of ionization by zinc for arresting the progress of Mooren's ulcer of the cornea, in all of which the cure was quick and complete.

The technique is described as follows: "A loop of zinc wire or the end of a zinc rod is armed with a fine web of absorbent wool, and dipped in a solution of zinc sulphate at 1 per cent. This forms the positive electrode, and is fixed in a suitable handle attached to the source of current. The negative electrode is the usual moistened plate or disc, applied to any convenient skin surface of the patient.

The eye must be carefully cocainized, and the positive electrode then held lightly against the ulcer so as to bathe its

whole surface with the zinc solution. An assistant then turns on the current very gradually up to 1 milliampère or 1½, according to the size of the ulcer and the toleration of the patient. It must also be turned off very gradually at the close of the application.

The current is to be applied for three or four minutes in one application, or for a little longer if done in two installments. The patient needs to be carefully handled and encouraged, because it appears that the procedure is in some way disagreeable or alarming. At any rate that has bene my experience. The patients become agitated, although they admit that the application is not specially painful. Perhaps this apprehensive state is due to the indefinite image of the electrode, as seen out of focus, or it may be an effect of the current. The eye should be treated for a day or two by instillations of zinc sulphate (1 per cent.) after the ionization is over. A single good application should cause healing within a week."

C. H. M.

The Action of Intermittent X-ray on General Metabolism and Chronic Degenerative Diseases of the Eye. —Cook, Fipley R., New York. (*Med. Record*, May 7, 1910.) The writer gives a second report on a new method of X-ray treatment by means of the regenerative action obtained by intermittent exposures in contradistinction to the degenerative effects which usually follow the use of continuous exposure. The flash treatment, which consists in making and breaking the primary current to give a period of rest after each explosive bombardment, resulted from futile efforts to maintain a simple stimulative action, in chronic degenerative conditions of the eye, with the routine method of treatment.

"About three hundred cases of extreme ocular conditions have been submitted to the intermittent X-ray treatment during the past two years, the vast majority of which were considered hopeless from the standpoint of the ophthalmologist. While in many cases only a slight visual improvement was apparent, there were comparatively few absolute failures, and the work, on the whole, has been most gratifying."

He states that the keynote of X-ray therapy consists in the fact that the local hyperemic action depends for the most part upon the potent influence of radiant energy on general me-

tabolism through the general circulation, and although we are able to obtain, by modifications of technique, a predominence of either a local or general action, under no conditions is it possible to absolutely separate the two, and no doubt the degree of success which may attend our efforts depends in a measure upon the adjustment of these two factors to the special requirements of each individual case.

In regard to the action of flashes in the eye, he claims to have observed the formation of new blood vessels in fibrous tissue (corneal opacities, fibrous thickening of the lens capsule), increase in the terminal twigs of the retinal artery, changes in chronic exudates, and increase in pupillary reaction. When the intraocular tension is + the tendency is to reduce it, and in degenerative conditions, with tension—, the result has been to increase it. He asserts that the use of such flashes will cause contraction of the blood vessels in vascular keratitis until their identity is more or less lost and a diffuse capillary congestion only remains; absorption in corneal, pupillary and vitreous opacities, retinal and chorioidal exudates, and in subretinal effusions. "A tonic action is seen in asthenopia, either with or without errors of refraction. Eye-strain, with the attending reflex nervous disturbance, has responded in numerous instances to a surprisingly limited number of flashes. By relieving the tension on the ciliary muscles they relax accommodation in cases of apparent myopia. In progressive degenerative conditions quite beyond the possibility of any improvement in vision they tend to fortify the more viable tissues and to facilitate the natural reparative processes."

He gives the histories of a few selected instances in all of which marked improvement seems to have taken place in desperate cass. Thes include examples of optic nerve atrophy, detachment of the retina, ulcer and opacity of the cornea, leucoma adherens, and immature cataract. His conclusions terminate with the query: "If radiant energy has a favorable influence on extreme ocular conditions when other means have failed, may we not expect that it would have a more potent preventive action if resorted to in incipient stages?"

C. H. M.

MISCELLANEOUS.

The Indian Oculist, His Equipment and Methods.—Drake-Brockman, Lt. Colonel H. E., I. M. S. (*Indian Medical Gazette,* June, 1910) refers to his original paper in the *Transactions of the Ophthalmological Society of the United Kingdom,* 1907, in which he gave the first complete account, taken at first hand from what he had actually seen, of the cataract-pricker and his awful ways. He presented complete sets of their instruments to different museums. The craft is hereditary, handed down from father to son and there is no literature amongst them on the subject. Many of the operators are of great age, one being met with over eighty. The operation is done by a preliminary scleral puncture, the needle being passed in about 6 mm. outside the sclero-corneal junction. This is done with a shielded lancet. The couching needle, usually triangular in shape at its end and "stopped" with cotton wrapped round it to limit the depth of entry, is then passed in through the hole and the lens is depressed into the vitreous. No antiseptic precautions are observed and many eyes are lost from irido-cyclitis, suppuration, etc., others from secondary glaucoma. F. M. P.

The Anomalies of Ocular Dominance.—Gould, George M. and Durand, A. C., Ithaca, N. Y. (*Med. Record,* July 23, 1910.) The writers call attention to the fact that many people habitually close one eye, usually the left, when looking definitely at some object or when observing something with care, and that it is "the dominant eye," usually, that is put to single use, the poor image of the non-dominant one being wholly secluded by closure.

They give the histories of a number of such patients, and from a study of such examples conclude among other things: 1. That perhaps three per cent. of eyestrain sufferers are troubled with disorders consequent upon the anomalies of ocular dominance. 2. Except in so far as it has influenced the primary shapes and sizes of the eyeballs, heredity has no influence in the production of right-handedness and left-handedness. 3. Right-handedness and left-handedness arise in the first year or two of life, and are caused by the dominance respectively of the right or of the left eye. 4. Dominance is

dictated and established by the better vision of the right or of the left eye, in the great majority of cases, by the less incapacitaing ametropia existing at the time of the beginning of the habits of willed arm-and-hand actions. In relatively 92 per cent. of infants the right eye is the better or easier seeing eye, and in 8 per cent. it is the left. 5. The attempt to change the establishing or established habit of left-handedness in a child inevitably produces disease of many kinds, awkwardness, liability to accidents, incapacities, and it handicaps in all the subsequent life. 6. Reversals of dominance in a relatively small number of individuals, as life goes on, are inevitable.

C. H. M.

MUSCLES.

Muscular Debility of the Eye and Its Treatment.—Heiman, Ernest A. (*Wien. Klin. Rundschau,* Feb. 20, 1910).

When the degree of insufficiency is known, it is not difficult to prescribe the proper prism that will rectify the deficient convergence. This calculation, however, involves two errors: 1. The patient will, as a rule, accept a weaker prism than that which is found by calculation to be necessary. 2. The patient will not tolerate a stronger prism than 8°, i. e., 4° for each eye. G.

Torsion of the Eyeball.—Shute, D. Kerfoot, Washington, D. C. (*N. Y. Med. Journ.,* July 16, 1910.) In a full article on this subject the writer calls attention to erroneous views that are being taught in various textbooks in reference to physiological and pathological torsion of the eyeball and concludes his paper as follows: "In studying the movements of the eye, *three* very distinct and separate portions of the cornea are to be noted, viz.: 1, The apex of the cornea; 2, the horizontal meridian of the cornea and its outer or temporal extremity, and 3, the vertical meridian of the cornea and its upper extremity as observed in the primary position of the eyes. The position of the apex of the cornea at the end of a version of the eye is ascertained in reference to rotations around *two fixed* lines in Listing's plane,—a vertical and a horizontal axis. Rotations about the vertical and transverse axes in this plane can be compounded into rotations about any intermediate axis.

The amount and character of the deviation of the apex of the cornea are noted in reference to the point of intersection of the fixed vertical and horizontal lines in Listing's plane; in other words, in reference to the location of the apex of the cornea in the primary position of the eye. The amount and character of the virtual torsion of the eye are ascertained by noting the tilt, one way or the other, of the upper end of the vertical meridian of the cornea in reference to the vertical plane through the whole length of the line of fixation, and by regarding the eye along the line of fixation and not by regarding the eye along a fixed anteroposterior axis perpendicular to Listing's plane. Further, we must rigidly distinguish between *actual* rotations, or versions around axes in Listing's plane, and *virtual* rotations or torsions around the line of fixation of the eye. C. H. M.

MYOPIA.

The Development of Myopia.—Levaisson, George (*Wien. Klin. Rundschau,* March 20, 1910).

In order to prevent the progressive development of myopia during the adolescence it is necessary to prevent the bending forward of the body and head in nearby work. This can easily be accomplished by improving the school bench. The beneficial result of full correction in myopia is due mostly to the fact that the glasses obviate the necessity of bending forward the head in nearby work. J. G.

OPERATIONS.

Implantation of a Metal Ball in Tenon's Capsule (the Frost-Lang Operation), With Report of 48 Cases. —Sweet, William M., Philadelphia (*Arch. Ophthal.,* Sept., 1910, XXXIX, 467), gives the result of his experience with the Frost-Lang operation in 48 cases. There was loss of the ball in 2 cases, and in these cases an excellent stump was obtained, giving considerable movement of the artificial shell. In 5 of the cases of injury there was evidence of sympathetic irritation at the time of operation and in 2 of the cases there was considerable photophobia. All symptoms of sympathetic irritation ceased after operation and no reaction followed the

insertion of the gold ball. In 42 cases gold balls were implanted, while platinum balls were used in 6 cases.

The author gives the advantages of the implantation operation over simple enucleation, and believes that, with the exception of malignant growths and purulent inflammation, there is no contraindication to the operation of implantation. He discusses the complications that, it is claimed, may arise after implantation operation, as protracted convalescence, escape of the ball, displacement of the ball, and sympathetic disease. Sweet does not believe that, in any case, we can positively point to the implanted ball as the primary and exciting cause of the symptoms in the good eye. W. R. M.

Transplantation of Fat Into the Orbit.—Bartels. Martin, Strassburg (*Arch. f. Aug.*, 67, p. 1), upholds his original recommendation to transplant the fat after enucleation, not after exenteration, as the rigid avascular scleral capsule furnishes such unfavorable conditions of nutrition, that the adipose tissue disappears, leaving only the liquid fat, before the vessels and connective tissue can grow into it. Observation on children in whom the preservation of the transplanted own fat tissue is much more promising, will allow a more definite estimation of the method. C. Z.

To the Removal of Organic Entropium of the Lower Lid.—Kuhnt, H., Bonn (*Zeitsch. f. Aug.*, XXIV, 1910, August, p. 151), emphasizes again, that for the treatment of organic, or trachomatous, entropium of the lower lid and trichiasis the enucleation of the tarsus is eminently useful. The purpose of the enucleation is to remove the deformed and more or less cicatricially degenerated tarsus up to a small marginal seam about 2 mm. wide, without sacrificing a particle of mucous membrane. The experience in many hundred cases has taught that also the radical cure of granulosis is thereby greatly promoted.

K. devised the following operation: After the lid is fastened in K.'s lid hemostat, the conjunctiva and tarsus, from 1.5 to 2 mm. from the inner edge and parallel to it, are incised from close to the tearpoint to the outer commissure, the conjunctiva and connective tissue dissected from the anterior surface of the tarsus, and the connective tissue of the lid from the

anterior surface to the lower convex border. The tarsus, now on both sides free, is at its lower margin severed from the adherent tissue. The conjunctiva, from about 1½ to 2 mm. next to the incision, is taken up with 2 or 3 double-armed threads, which are conducted on the anterior surface of the remainder of the marginal tarsus to the anterior edge of the lid and pulled so that the lid borders and cilia are in perfect position, turned downwards and fixed with adhesive plaster on the skin above the lower orbital margin. The sutures are removed on the 4th or 5th day.

Recovery is generally undisturbed and the result excellent. A relapse was never observed. It is essential that the conjunctiva and tarsus are incised not farther than 2 mm. from the inner edge of the lid and exactly at right angles, not obliquely.

For those cases in which the cicatricial conversion of the granular conjunctiva is not yet completed, and infiltrated islets alternate with scars, K. saw very satisfactory results from his modification of the longitudinal tarsotomia of von Ammon, which is also described and illustrated. C. Z.

A Method of Applying Thiersch Grafts to the Orbital Cavity.—Morrison, Frank A., Indianapolis. (*Journal of the Indiana State Medical Association,* Sept. 15, 1910.) A piece of sterile gutta percha tissue is laid on the surface to be covered and an exact pattern made by the use of small scissors, then the pattern is removed. A piece of gutta percha tissue two or three inches square is removed from the bowl of normal salt solution and spread evenly on the sterile towel. The Thiersch graft, cut in the usual way, is transferred directly from the razor blade to the upper moist surface of the gutta percha, raw surface up, and all wrinkles carefully smoothed. With a pair of small sharp scissors, the tissue and the adherent graft are cut to correspond to size and shape of the pattern. The graft is then placed face down on the surface to be covered. A piece of "white wax" (a mixture of wax and paraffin) is molded, then trimmed and shaped to fit the orbit. The writer makes the lower edge rather sharper than the upper to provide a sufficiently deep sulcus for the retention of the artificial eye. After its insertion, a pad and light bandage is applied to both eyes for two days. Every day it is removed and the edges of the lids gently washed, some of the

normal saline being allowed to flow into the orbit. The third day the splint is removed, the eye irrigated and the splint re-inserted. On the fifth day the gutta percha is removed, the splint is worn day and night for three weeks, then the artificial eye inserted. M. D. S.

Mode of Action and Indications for Simple Sclerectomy.—Bettremieux, Roubaix Nord. (*Annales d'Oculistique,* January, 1910.)

The former view that sclerotomy created a filtering cicatrix is still *sub judice,* while simple sclerectomy at present deserves our most careful study. Bettremieux believes that even if sclerectomy does not create a filterinz zone, it is not necessary to cut a hole in the sclera, since it can be thinned down and thus influence the circulation in the anterior perforating vessels, as well as in the canal of Schlemm. Sclerectomy may be compared to Talma's operation for scirrhosis of the liver. It is also analogous to decortication of the kidney, which influences the vascular supply of that organ, and creates a complementary circulation.

He endorses Meller's critique of Lagrange's contradictory argument that while thinning of the sclerotica is of value in his own operation, it will not prove beneficial in anterior sclerectomy. Lagrange also pretends that the larger scleral wound will not proliferate so easily. Meller, nevertheless, urges simple sclerectomy in cases of high tension whenever it appears dangerous to open the globe, and argues further that this view is borne out by the material reduction in tension following the insertion of a needle and thread into the sclera in operations for advancement of the ocular muscles.

Bettremieux's sclerectomy is a pericorneal scleral excision that does not expose the iris to prolapse, and preserves an active pupil. Its size can be varied according to the needs of the case. It can be located below the cornea, thus leaving the upper area for iridectomy, if it should be required later. The greyish appearance of the wound is due to the uvea showing through the thinned-down sclera and its conjunctival covering. There is no evidence of cicatrization. The operation has also proved efficient in retinal detachment. S. L. Z.

The Post-Operative History of Eighteen Cases of Magnetic Foreign Bodies Removed From the Eye by the

Haab or Giant Magnet.—Bull, Charles Stedman, New York. (*Med. Record,* Aug. 27, 1910.) The writer gives the post-operative history of eighteen examples, this limitation in number being due to the fact that most of the patients from whose eyes foreign bodies had been removed by the Haab magnet could not be traced subsequently. The particle of iron was located by X-ray apparatus in every case, and successfully extracted in every case but one, through the original wound in seven instances, through another channel in ten. The foreign body was located in the vitreous in eight cases, and in the fundus in ten; iridectomy was done at the time of extraction seven times; cataract developed in eight cases; enucleation was necessary in ten. Vision was permanently lost at the time of the accident in five instances; immediate useful vision followed in two cases, permanent useful vision in one.

From a careful examination of these eighteen cases, and of a large number of others already published by various authors, the writer emphasizes the following points:

"1. The foreign body should be located and an attempt made for its extraction as soon as possible after the accident, in order to lessen the dangers of infection.

2. When the wound of entrance is in the anterior segment of the eye, and the foreign body has been located in the vitreous or fundus, no attempt should be made to draw it forward by the Haab magnet through the wound of entrance. It seems far wiser to make an incision through the sclera at the nearest point to the location of the foreign body, and extract it by means of the small magnet.

3. These eyes are all suffering from the shock of the original accident, and we have not properly appreciated the severity of the second shock of applying the giant magnet, and forcibly drawing the foreign body through delicate tissue already seriously injured.

4. These eyes are all in a dangerous condition, and the prognosis must always be unfavorable, with the great danger of the development of sympathetic uveitis.

5. If infection has already begun, the eye should be enucleated at once.

6. While the prognosis in these cases is always very grave, it is better when the foreign body is lodged in the vitreous than when it is lodged in the retina or ciliary body.

7. Great care should be exercised in the application of the giant magnet, for more injury may be done by the fragment of iron or steel being drawn through the tissues by the magnet than was caused by the original accident.

8. If the attempted extraction fail, it is better to enucleate the eye at once.

9. Even after a successful extraction, useful vision will be permanently lost in the majority of the cases, and enucleation will be necessary in order to save the fellow eye. The danger of sympathetic inflammation is ever present, and a general insidious uveitis may develop months and even years afterwards and extend to the fellow eye." C. H. M.

OPTICS.

Is It Necessary to Protect the Eyes Against Ultraviolet Rays?—Best (*Wien. Klin. Rundschau*, March 6, 1910).

Under ordinary conditions ultraviolet rays, as well as light rays, if sufficiently intense, may produce injury to the eye. The light rays are more apt to do so than the ultraviolet ones. In order to protect the eyes gray glasses which diminish the intensity of all rays should be employed. Cases with increased sensibility of the retina are an exception, and for these blue glasses are preferred to the gray ones, because the retina is most sensitive to yellow. J. G.

Protection From Ultraviolet Rays.—(*Literary Digest*, Oct. 29, 1910.) "That cataract of the eye may be caused by over-exposure to strong lights containing ultraviolet rays, is suggested by a French scientist. The eye is now subjected to much stronger light than in the days of candles, and artificial lights are growing more and more glaring every year. The ultraviolet rays, invisible, yet capable of being photographed, are present in all white light from most powerful sources." A portion of an abstract from *The Hospital* (London) of the report of Dr. H. Bordier's investigation of the substances which the rays fail to penetrate, is as follows: "Vitreous humor is as transparent as water. The cornea arrests a large proportion of the rays, thus protecting the deeper parts of the eye. The crystalline lens is completely opaque to these rays. It be-

comes fluorescent under the influence of these rays, and in fulfilling the duty of protecting the retina in this way the author suggests that it may itself suffer from their action, resulting in the early production of cataract, as in the case of glass-makers and founders. Eyes operated upon for cataract, and in consequence deprived of their natural powers of defense, should be specially protected against the action of ultraviolet rays. The author points out further that such lights as the arc lamp, the Auer (Welsbach) light, and the mercury-vapor light should be used only for large spaces. On the other hand, the work-table or desk should be lighted by the oil-lamp or electric bulb, which are very feeble in ultraviolet rays. He makes the further interesting observations that the dust and smoke in the atmosphere of towns occludes these rays, and hence sunstroke is much rarer here than in the country and on the mountains. On the other hand, he suggests that the tonic effects of the country air are due to the same cause."

M. D. S.

OPTIC NERVE.

The Origin of Choked Disc.—Thorner (*Wien. Med. Woch.*, May 21, 1910).

Choked disc was easily produced by the injection of a toxic substance into the retrobulbar space; the injection of an indifferent substance could never produce choked disc. The author is, therefore, a firm believer in Leber's toxin theory and denies the possibility of producing choked disc by a continuous increase of tension in the intracranial fluid. He gives several reasons in corroboration of his theory: Increased cerebral pressure can be produced mechanically only when the contents of the cranial cavity increase at least 50 cc. We see, however, that small tumors are also able to produce increased tension in the interior of the eye. The increased tension is probably produced by a toxic inflammation of the Pacchionian corpuscles which inhibit the proper resolution of the subarachnoidal fluid. Inasmuch as there are in the perineural space of the optic nerve a number of capillary valves, it does not seem that an increased intracranial tension extends to the papilla and if such increased tension does exist it would extend to Tenon's capsule and produce an exophthalmus rather than a choked disc.

G.

ORBIT.

Orbital Abscess From Streptococcus Infection in a Case of Malarial Cachexia.—Pascheff, Sophia, Bulgaria. (*Annales d'Oculistique,* January, 1910.)

He refers to three rare cases of orbital abscess seen by him during the past two years, the first from rupture of frontal abscess into the orbit, the second from septic metastasis after dental extraction, which also involved the knee joint, and the third, herewith considered, from spontaneous development in a case of chronic malarial cachexia.

There were no other lesions or preceding traumatism. The malaria was chronic, but still liable to acute exacerbations. The progress of the orbital inflammation was slow, but exophthalmus appeared with almost complete loss of vision. The etiology was probably idiopathic rather than metastatic. Dubelir claims that malaria may itself provoke inflammation in the cellular tissue of the orbit. No other cavities were involved. The bacteriologic examination showed streptococcus pyogenes. Vision was reduced from normal to the counting of fingers. As there was no optic neuritis or thrombosis of the retinal vessels, the reduction was probably mechanical, due to the pressure of hypertension, for the vision spontaneously recovered to 6/x as soon as the abscess was evacuated. There was no central scotoma. S. L. Z.

PATHOLOGY.

Clinical and Anatomical Points in a Case of Cataract With Heterochromia.—Schlippe, Wuerzburg. (*Archiv. f. Aug.,* XLVII, 2, 3.) Author refers to 2 cases where cataract with Heterochromie was present. Operated with iridectomy; the excised bit of iris was examined histologically. He found exactly the same conditions described in detail by Fuchs.

First, there were fewer nuclei. Between these nuclei were missed the normal branched stroma pigment cells. Only in the anterior boundary layer was found pigment in the form of fine granules. The retinal pigment was quite normal.

Under high magnification the different cell forms in the iris stroma could be distinguished. In the outer layer were seen numerous well-colored round or oval nuclei with scanty

protoplasm. In the deeper layers the cells lay less thickly and between these were long stretched-out nuclei. Besides were seen large cells, the nuclei strongly staining and the protoplasm taking eosin well; the Fuchs "Mastzellen." The Russell cells the author did not find. Closely under the superficial layer was a densely staining, rather circumscript round-cell infiltration in which also some epithelioid cells were seen resembling a tubercular nodle. There were no giant cells. There was not enough material to stain for bacilli. In the periphery of the nodule were found many eosinophiles. The blood vessels showed clearly hyoline wall thickening. Author did not observe the pigmentation along the vessel walls observed by Fuchs.

Author says it was clear that the condition was a pathological one. E. C. S.

On Dispersion of Pigment of the Iris, Cornea and Lens, and on Cholestearin Crystals on the Iris.—Vossius, A., Giessen (*Centralbl. f. prakt. Aug.*, 1910, September, p. 257), after a review of literature, reports a few incident cases which led him to the following conclusions: After operations on the iris in iritis, glaucoma and cataract, and injuries of the eye, in which the iris is ruptured, a peculiar dispersion of pigment, almost as black as ink, occurs on the anterior surface of the iris, densest at the pupillary portion. Occasionally it is encountered on the posterior surface of the cornea. This pigment originates from the retinal pigment layer of the iris, of which larger pieces may be detached which sink to the lower sinus or anterior surface of the iris or are suspended in the anterior chamber. Sometimes they are seen in cases of iritis without iridectomy. Pigment of the same origin on the posterior surface of the lens is very rare. The dissemination of pigment may remain unchanged for many years.

In intraocular pieces of iron with siderosis of the iris, and after absorption of hemorrhages in the anterior chamber, an aspersion with pigment dots may follow. These dots look dark brown like sepia in siderosis, reddish brown to chestnut brown after absorption of hemorrhages. They must not be identified with light yellowish red and brownish, more coarse, particles of pigment with near pigment naevi or without them. In

siderosis the pigment dots apparently consist of rust, in hemorrhages of the anterior chamber of hemosiderin, which in such cases is found microscopically in small brownish particles of crystaline reflex on the anterior surface and in the anterior layers of the iris. Very rarely are cholestearin crystals visible on the anterior surface of the iris as fine, glistening, golden dots. They may occur in iritis in the course of healing.

C. Z.

Anatomical Examination of Four Eyes With Traumatic Iridocyclitis.—Watanabe, E., Hiroschima, Japan (From the eyeclinic of Prof. H. Schmidt-Rimpler, in the University of Halle. *Klin. Mon. f. Aug.*, 48, II, August, 1910, p. 250), describes the microscopic conditions of four eyes, of which only one had caused sympathetic ophthalmia, but presented the same changes as the other three. This is in accordance with the observation of Ruge and Schirmer contradictory to the investigations of Fuchs, who asserted the possibility to recognize anatomo-pathologically the form of traumatic iridocyclitis which leads to sympathetic ophthalmia. Deviating from the description of Fuchs was in the exciting eye the affection, and small-celled infiltration, of the anterior portion of the iris, which in sympathizing inflammations are said to be free. The anterior portions of the chorioid were more infiltrated than those nearer to the posterior pole, which, according to Fuchs, is vice versa in sympthizing inflammation. Also the exudations, filled with cells, lying upon the chorioid did not fit into the characteristic picture. This could, according to Fuchs, be only a mixed infection.

But by this assumption the diagnostic value of the anatomical examination is lost. Thus W. inclines to the conclusion, that in a series of cases a certain distinction between exciting and not exciting nflammatons cannot be made from the histological examination. Consequently the support which might be found in the anatomo-pathological differentiation of both for the assumption of a specific sympathetically acting microbe, loses considerable in value.

Clinicvally it was interesting that the sympathetic affection in case 4 consisted, during its whole course, in serous iritis without other inflammatory symptoms, and healed with full vision. As there were only a few slight deposits on Descemet's

membrane and in the pupillary area, the process might easily have been overlooked. C. Z.

On the Importance of the Cornea Mucoid for the Development of the Primary Opacity After Cauterization. —Guillery, H. Coeln (From the bacteriological-laboratory of Prof. Gaplewski, Coeln. *Arch. f. Aug.,* 66, p. 252), reports his experiments on the action of lactic, formic, tartaric, oxalic, trichloracetic acids, and chloride of zinc, on the cornea of rabbits and on solutions of mucoid, obtained by extracting, for 24 hours in the incubator, about a dozen corneae of larger animals which were cut into small pieces, after admixture of ammonia.

The results were in accordance with those observed by the author in his former experiments with nitric, sulfuric and hydrochloric acids, viz. sedimentation of the mucoid of the cornea and subsequent solution of the sediment. Clinically corresponded to this the primary opacity of the cornea which, after further cauterization, cleared up. At the periphery, which the acids reach in a certain dilution, a ringshaped opacity develops, because here the concentration of the acid does not suffice for its solution. But also this ring can be removed by a more intense action of the acid under formation of a new ring at the outer circumference of this new spot of cauterization.

Thus these investigations fully corroborate the explanation which G. gave for the peculiar action of so many acids on the cornea. The occurrence of the primary opacity and its further course immediately after cauterization is governed by the chemical reaction of the mucoid of the cornea to the respective caustic. The resulting organic combination explains the phenomena which so far were not only not understood, but not even correctly observed. For the therapeutic clearing of the primary opacity the chemical properties of this mucoid combination must be of the first consideration. None of the caustics had the same deleterious effect on the lens as observed by G. after hydrochloric, nitric and sulfuric acids.

Carbolic acid instantaneously produced a greyish white superficial eschar on the cornea. This could not be due to an alteration of the mucoid, as the carbolic acid could not penetrate the cornea so rapidly. Nor did carbolic acid have any effect on the mucoid solution. The eschar produced by car-

bolic acid disappears, for the greatest part, by irrigation with water. This corresponds with the fact that albumen is coagulated by carbolic acid, but the coagulum dissolved by water. The slight spontaneous clearing of opacities of the cornea produced by carbolic acid may thus be from a solution in the ocular fluids, partly from a colliqueation of the opaque epithelial layers.

Pure mercantile formalin produced after a few minutes a slight haze of the cornea, confined to the epithelium. The impossibility to create by formalin a more intense primary opacity was confirmed by the chemical test with mucoid solution, in which 10 per cent. of pure formalin produced no sediment. C. Z.

Black Aqueous Humor.—Salus, R. (From the eyeclinic of Prof. A. Elschnig in the University of Prag. *Deut. Med. Woch.*, 1910, No. 20, p. 939.) After extraction of a cataract in a woman, aged 39, who had diabetes (5.2 per cent. sugar) a thin dirty greyish black aqueous oozed, especially upon massage. The iris was spongy. The healing was smooth, with V. 0/vi. The aqueous showed numerous pigment granules, partly large, swelled, cells with indistinct, frequently interrupted, boundaries, and contained scanty pigment. This peculiar phenomenon has so far been seen only in diabetes, except by Vossius and Kostenitsch, who observed it also in eyes of non diabetic individuals.

S. gives the following explanation: Undoubtedly different kinds of cells show a different behavior towards sugar contained in the tissue fluids. It is possible that the pigment epithelia of the iris have a greater affinity to sugar and absorb sugar from the aqueous even if this contains only small quantities, similar to the different staining of dead and living cells by different stains. Hence they gradually acquire such a high percentage of sugar, that the aqueous in comparison becomes hypotonic, in spite of its contents of sugar, and the cells swell, become hydropic, displace one another and are deformed. C. Z.

On a Few More Cases of Heterochromia Iridum.—Lutz, Anton (From the eyeclinic of Prof. O. Haab in the University of Zürich. *Deut. Med. Woch.*, 1910, No. 24, p. 1125), reports on 30 more cases which came to his observation

within the last 3 years, 17 of which showed complications, which are arranged in tabular form. He gives the following resumé: 1. Heterochromia iridum is a rare affection. It occurred in 0.2 per cent. of all patients. 2. It consists in a disturbance of development and may appear in 3 forms: One eye lags behind in pigmentation, (a) from the first few days after birth, (b) later from the 5th to 15th year, (c) later on, loses in pigment. 3. For its explanation, hereditary transmission of the color of the eyes of the parents must be considered in the first place, then further disturbances (perhaps anomalous embryonic development of the blood vessels) for the loss of the correlation of the color of the eyes and the striking frequency of diseases of the lighter eye. 4. Such heterochromic eyes show complications which may be atypical, e. g., colobomas, and may affect either of them, or typical, which always occur in the lighter eye. Paresis of the sympathetic nerve, encountered in about half of the cases and without practical importance, may belong to these, but certainly cyclitis, which occure at least in one-half of the cases. 5. This cyclitis shows a certain peculiarity. It is extremely chronic, lacks all injection, is strictly monocular and is characterized by very fine deposits, rarefaction of the pupillary margin, absence of synechiae, frequent formation of cataract, resistance to therapeutic measures, favorable prognosis of cataract operation. It begins at the earliest at the commencement of the second decennium, mostly towards the end of it, and causes the chief symptoms in the third and fourth decennia. It bears no definite relations to gender, occupation or general diseases. 6. Various factors speak against a common cause of heterochromia and cyclitis. Cyclitis occurs only in the less pigmented eye. In consequence of the disturbance of development the eye is predisposed to disease, its power of resistance is spent in the struggle with external injuries influences. C. Z.

A Contribution to the Study of the Ideographic Cerebral Center With Report of a Case.—Würdemann, H. V., M. D., Seattle, Wash. (*International Clinics*, Vol. III, Twentieth Series.)

The case history is given, the operative procedure being decompression, which was followed by appreciable results. The author shows the exact condition of the mentality by a series

of pictures, writing, numbering and drawing from memory. Also pictures of writing and drawing from memory and from copy. His resumé of this case is as follows:

This case shows: (1. Pathologic Anatomy.) An injury to the skull and cerebral cortex on the left side over the first frontal convolution, anterior to the fissure of Rolando. (2. Pathology.) Atrophy or inhibition of function of the underlying cortex from undetermined atrophy or disassociation of the connecting radiations of the several cortical centers presiding over the function of language. (3. Physiology.) Ultimate effect of the injury evident in incomplete development of the motor center for writing, which, with its radiations, I denominate the *ideographic center,* or that having to do with the memory and reproduction of visual images, so that the patient has not, despite relief of brain pressure and training of the mental faculties, been able to develop sufficiently active brain cells for the education of this function or art. The faculty of numeration, which depends, in large part, upon the memory of visual images and their reproduction by some form of sign, and which includes the estimation of size, form, and distance of objects, as well as number, has been developed by education. This faculty probably has no definite center, but like general ideation or inteligence, is not concentrated and localized in a definite region of the brain, but is an association of centers as with language, which also is not limited to one center, but is an association of a number of sensory and motor centers and their radiations or associations. This has been fairly definitely located on the side of the brain, as noted in the descriptive part of this essay. Cerebral localization has been aided by this case showing that an injury of the ascending frontal convolution destroys in whole or in part the ideographic faculty, and to this part of the cortex may be ascribed this function. (4. The Operation.) In a surgical sense, this shows that large areas of the brain may be safely exposed and explored by a properly conducted operation, and that even large detached bone flaps will again grow into place. (5. Results.) The results of the surgical, medical, and educational treatment have been relief of brain pressure with loss of headaches, further mental development, and production of a nearly normal individual.

A. M. MacW.

PHYSIOLOGY.

The Condition of the Pupils in the Newly Born and During the First Year of Life.—Guden, Hans (*Wien. Klin. Rundschau,* March 27, 1910).

The pupils of a newly born infant during sleep are wider than those of an adult; they have a diameter of 2.2-2.5 mm. On awakening, dilatation is slow and never exceeds 3-3.5 mm. If the child is shaken up or slapped on its back the dilatation is somewhat more rapid. After the third month the pupils become narrower during sleep, and in the sixth or seventh month the myosis falls below 1.5 mm. The lightning-like wide dilatation as it is observed in adults does not occur until the child has passed its first year of life. G.

Comparative Physiological Investigations on the Interchange of Fluids in the Eyes of Birds.—Abelsdorff, G., Berlin, and Wessely, K., Würzburg (From the Physiological Institute in Berlin. *Arch. f. Aug.,* 64, *Ergaenzungsheft,* p. 65), for the purpose of answering the principal questions as to the origin and regeneration of the intraocular fluids, made very numerous experiments on the eyes of birds, chiefly pigeons, chickens and owls, in which they examined: (1) The composition of the ocular fluids in normal and abnormal conditions, and their quantitative and qualitative regeneration; (2) the phenomena of the appearance of fluorescin in the eye after its introduction into the blood current; (3) the anatomical changes after evacuation and restoration of the ocular fluids; (4) by extirpation of the single pertinent parts of the eye studied their importance or insignificance for the interchange of fluids.

The results were: The normal intraocular fluids of birds show, aside from unessential deviations, the same composition as the eyes of mammals, but the vitreous is easier movable and evacuable. The regeneration of the ocular fluids is faster and more complete, e. g., the loss of a quantity of fluid equal to the whole volume of the large eyes of owls is replaced within 12 hours.

In birds the vitreous takes a much greater part in the restoration of the anterior chamber than in mammals. This is due to an easier communication between both chambers and a

greater expansibility of the chorioid so that through the occurrence of an extreme hyperemia of it the loss of contents of the vitreous chamber can be immediately replaced. Consequently in day-birds with relatively small anterior chamber and large vitreous space the restoration of the anterior chamber after puncture is almost momentaneous.

The participation of the vitreous in refilling the anterior chamber decreases, by its consumption, with the number of punctures of the anterior chamber, which is indicated by increasing contents of albumen of the aqueous through increasing ciliary secretion.

The regeneration of directly evacuated vitreous fluid is also very speedy, but without essential increase of albumen.

Fluorescin introduced into the blood circulation appears in the ocular fluids by diffusion from the anterior surface of the iris, the pecten and the chorioid. After puncture of the anterior chamber the stain is seen to exude in larger quantities mainly from the ciliary processes. Although there are only slight anatomical indications that in the eye of birds, in comparison to the eye of mammals, the new formed albuminous aqueous humor originates in the ciliary processes (missing of epithelial vesicles), its source must be ascribed to these by exclusion, since in the experiments the evulsion of the iris showed that the iris, in spite of its great abundance of blood vessels in birds, is entirely dispensable for the production and regeneration of the ocular fluids. The iris participates only in the exchange of diffsible substances.

In birds the ciliary processes take much less part in the production of the vitreous fluid than in mammals; for their operative removal does not, as in these, lead to total vanishing of the vitreous. On the contrary, it is completely preserved, and only the anterior segment of the globe becomes phthisical. The secretion of the vitreous humor must chiefly take place from the pecten and the chorioid. Although after evulsion of the ciliary processes the pecten becomes very hypertrophic, the chorioid plays the more important part in the production of the vitreous humor, as the experiments of extirpation of the pecten indicate its relative unproductiveness. The nutritive function of the pecten does not exclude a simultaneous optical function. The chorioid also furnishes the nutrition for the avascular retina.

The main difference of the intraocular interchange of fluids between mammals and birds lies in the greater independence in the eye of birds in the production of the aqueous on the one hand and of the vitreous fluid on the other, as the source of the aqueous are essentially the ciliary processes, of the vitreous chorioid and pecten. Although the separation between anterior and posterior segments of the globe is not so strict that any participation of the ciliary processes in the production of vitreous must be denied, the possibility exists in the eye of birds of phthisis limited, for a longer time, either to the anterior or posterior segment.

Four colored plates illustrate the various anatomical and histological conditions. C. Z.

Does Cutting of the Optic Nerve Elicit Perception of Light?—Hess, C., Würzburg (*Arch. f. Aug.,* 67, p. 53), tested this in several cases with healthy optic nerves. The enucleation was done after injection of anesthetics into the surroundings of the optic nerve. The patients, who before cutting the optic nerve were asked to observe whether at the moment of the section they perceived light, all denied doing so.

H., however, was not satisfied with this, as the objection might be raised that the lack of perception of light might have been due to the injected anesthetics. This objection did not exist in an intelligent patient, aged 41, whose ganglion Gasseri had been extirpated on account of neuralgia of the fifth nerve. By repeated attacks of neuroparalytic keratitis he was so annoyed that he wished the enucleation of the eye, which still saw fingers at 3 mm. The enucleation could be done without anesthetic. Cutting of the optic nerve was perfectly painless and the patient most decidedly asserted that he had not the slightes perception of light. H. consideres this case as a proof that cutting of the healthy optic nerve does not, as frequently assumed, elicit perception of light. C. Z.

On the Specific Energy of the Optic Nerve.—Feilchenfeld, Hugo, Berlin. (*Arch. f. Aug.,* 67, p. 45.) The left eye of a man, aged 40, with central V. of fingers at 2 mm., was enucleated for an intraocular tumor. On account of insufficiency and stenosis of the aorta the operation had to be performed without narcosis. The pain at the moment of cut-

ting the optic nerve was overwhelmingly intense, but the patient did not notice any perception of light. Also touching of the optic nerve with forceps a few hours later, was very painful, but did not elicit sensation of light. Whether the pain was transmitted through the optic nerve or the ciliary nerves cannot be decided. F., however, believes that the clinical experiences suggests that the optic nerve may be sensitive to pain, viz. the spontaneous dull pain in retrobulbar neuritis, and the pain caused by glaring, which must be localized in the papillo-macular fibers. There are, however, reasons for the assumption, that within the papillo-macular bundle the paths of the pain of glaring and the sensation of light may be separate, so that nothing essential can be said against the specific energy of the single fiber. It certainly cannot be concluded that the light perceiving fiber of the optic nerve reacts to whatever excitation else but with sensation of light.

The fact that no light was perceived, when the optic nerve was severed, is no proof against the law of specific energies, as the excitation struck the stem of the optic nerve, in which even the adequate excitation, viz. the light, does not create the specific sensation of light. But mechanical excitation of the receiving organ, i. e., the retinal elements, undoubtedly causes sensation of light, e. g., blow on the eye, the seeing of sparks in beginning detachment of the retina. If in cutting the optic nerve now and then flashes of light should have been noticed, most likely the traction on the eyeball, i. e., a mechanical excitation, was the cause. C. Z.

Investigations on the Light Sense of Fishes.—Hess, C., Würzburg. (From the Zoological Station at Naples. *Arch. f. Aug.*, 64, *Ergaenzungsheft*, p. 1.) This exceedingly interesting essay gives the first systematic experiments on the vision of fishes, which are described in detail. After H. found by very ingenious methods that the fish by the manner in which they react to differences of intensity of light give very exact information on the brightness in which they see different radiations, he ascertained the distribution of brightness in the spectrum for the eye of the fish. H.'s methods devised for this purpose are chiefly based on the observation that the examined fish possess a very fine discrimination for brightness and that

very young of certain species swim towards places which are the brightest for them.

H. thus found: For certain salt water fish (atherina hepsetus) and fresh water fish (leuciscus rutilus and squalius cephalus) the brightest point of the spectrum lies at the region from yellowish green to green. From here the brightness diminishes for them relatively rapidly toward the long-waved end. The yellowish red and red rays of the spectrum have for these fish a very small value of brightness. Towards the short-waved end it also diminishes, but less rapidly.

Owing to this fact, if one-half of a basin is illuminated by red the other half by blue light, the fish gather in the blue, even if to our light-adapted eye the red appears distinctly brighter than the blue. Feeding experiments on grown-up specimens of Julis pavo and blennius ocellaris yielded the same results and showed great similarity with H.'s former investigations on birds, viz., that also the fish in obtaining their food are mainly or exclusively guided by the visual organ. That the animals did not desist from aiming at the meat, which was used for bait, on account of the red color was easily proved; by increasing the intensity of the red portion of the spectrum which illuminated the meat they swam towards the meat and took it.

The relative brightness, in which the examined fish see the various parts of the spectrum coincide exactly, or almost so, with those in which the totally color-blind man sees them at any intensity of light, and the normal dark-adapted man at corresponding lower intensity. The values of brightness found by H. in fish thus strikingly correspond to the curve constructed by Ewald Hering, here reproduced, for the totally color-blind and the normal dark-adapted human eyes.

In an appendix H. reports his experiments on the behavior of amphioxus to the influence of rays of different wavelengths, which showed that the rays from yellow to green of the spectrum exert the greatest effect on amphioxus. The light-adapted animals reacted scarcely, or not at all, to intensities of light to which the dark-adapted frequently responded with lively movements. C. Z.

Investigations on the Light Sense of Invertebrates. — Hess, C., Würzburg. (*Arch. f. Aug.*, 64, *Ergaenzungsheft*.

p. 39.) H.'s investigations on the light sense of invertebrates are based on his studying their behavior towards 2 lights of equal composition but very intensity, which could be measured by his photometric methods, described in detail. As in his former researches on the light sense of birds and fish, also the present showed the great, partly determining, influence of light, or dark, adaptation upon the results of the observations, and H. emphasizes that neglecting the state of adaptation by all former investigators led to erroneous conceptions. Those animals which in the photometric experiments reacted to very slight differences of the intensities of light, were also tested in their behavior to colored lights, especially those of the spectrum. H. experimented on fresh water crawfish, viz. daphnia, chydorus sphaericus, mysis longicornis, and caterpillars, in different states of adaptation. They visibly reacted to relatively slight differences of intensities of light and gave an idea of the boundaries within which photometric measurements in various species are possible.

H.'s experiments proved the untenability of the general opinion that in the orientation of these animals to light, just as in plants, the more refrangible rays predominate over the less refrangible. He also disserts how this erroneous opinion could arise. In comparative experiments with red and blue glasses of which the red at sufficient illumination appears to the normal light-adapted human eye lighter than the blue, the animals, otherwise aiming to the, for us, light, seek the blue which appears to us distinctly darker. Hence the exclusive or stronger effect of the short-waved rays on orientation was erroneously inferred. H. showed that other factors prompted the animals to seek the blue, among other proofs, by increasing the light intensity of red and diminishing that of blue. Now the long-waved rays are more effectual for orientation than the short-waved. In using 2 lights of equal composition, relatively slight differences in the intensities of light suffice to urge the animals to the lighter half. Hence H. concluded that in the experiments with red and blue glasses the animals merely strive to the lighter parts, viz., in the first mentioned experiments to the blue, because it appears lighter to them than the red, exactly like to our dark-adapted eye in properly subdued illumination, respectively the totally color-blind eye at any illumination.

This view was materially corroborated by the observations with the spectrum; not the short-waved but the homogeneous rays from yellowish green to green had the greatest effect on the orientation of the animals. From there the effect diminished rapidly towards the long-waved end, more gradually towards the short-waved end. H. thus found a funamental difference in the ependence of orientation on the wave-length in invertebrates, and similar in fish, from that in plants according to the researches of con Sachs.

Of special interest is the proof that also in the invertebrates, examined by H., the rays corresponding to the region from yellowish green to green in the spectrum have for them the greatest brightness. The invertebrates, experimentd upon, differ in their behavior to various homogeneous lights, and to red and blue glass lights in a characteristic manner from the light-adapted eyes of man and birds at medium and intense illuminations. They show in these relations a far reaching striking resemblance to the dark-adapted human eye at subdued illumination, to the fish, so far examined, and the totally color-blind human eye at any illumination. C. Z.

The Independent Origin and Development of the Crystalline Lens.—Stockard, Charles R., New York City. (*American Journal of Anatomy,* July, 1910.) This subject is discussed under the following captions: "1. Introduction. 2. Method and material. 3. Lens in living embryos. 4. Embryos studied in section. (a) As to origin of the lens, is the ectoderm dependent upon a contact stimulus of the optic vesticle? (b) As to the lens-plate or lens bud capable of differentiating into a lens without contact with an optic cup. (c) Does the size of the optic cup regulate the size or shape of its associated lens? (d) As to optic vesicle, normal or defective, always capable of stimulating lens formation from the ectoderm at some stage of its development. (e) May the optic vesicle cause lens formation from ectoderm other than that which normally forms a lens? (f) Does a deeply buried eye have the power to regenerate or form a lens from its own tissues? 5. Discussion of previous observations and experiments. 6. Summary and conclusions. 7. Bibliography." Accompanying this paper are 28 text figures and two plates. It is of much

scientific interest to anyone making a special study of this subject. M. D. S.

REFRACTION AND ACCOMMODATION.

Some Observations on Car Nausea.—Ayres, W. McL., Cincinnati. (*Ohio State Medical Journal,* Sept. 15, 1910.) The writer discusses the various conditions under which this may occur and many different varieties and causes of it. Of the seventy-five cases observed by the writer in four years, thirty had plus astigmatism contrary to rule, and thirty-one had plus astigmatism with the rule. "In over nine hundred cases of hyperopic astigmatism (simple and compound), there were only fifty-eight cases contrary to rule, or fifty-one per cent. of the cases with astigmatism against the rule had car nausea, while only three per cent. of those having astigmatism with the rule complained of it. In myopic astigmatism, both simple and compound, the proportion is decidedly less, and in the few cases of minus astigmatism contrary to rule, only one-fourth of them complained of car sickness, or just one-half as many as found in plus astigmatism contrary to rule. Car sickness was found in every case associated with astigmatism with or without some other forms of ametropia, it was found in mixed astigmatism and it is to be noted also that fifty-five per cent. of those unusual cases which had astigmatism with the rule in one eye and against in the other complained of it." The writer did not believe that muscle balance was an important factor in this condition, an opinion contrary to that held by two of those who discussed the paper. Many cases were completely cured, and all were benefited by the adjustment of correct lenses. M. D. S.

The Economic Value of Family Physician Refracting. —Connor, Leartus, Detroit. (*Bull. Amer. Academy of Med.,* August, 1910.) The author summarizes as fololws: "The possible economic value of 'family physician refraction' appears in the following particulars: 1. It gives patients improved vision and relieves their discomfort. 2. It makes better doctors, by developing power, otherwise left dormant. 3. It augments professional income. 4. It bridges the chasm that bars the free cooperation of family physician and ophthalmol-

ogist. 5. It strengthens physicians' organizations. 6. It furnishes prompt relief to all victims of eye disorders. 7. It brings the largest returns of ophthalmology by providing an educated physician competent to study every eye case. 8. It improves general practice by furnishing family physicians trained to detect the significance of eye symptoms in every disorder." M. D. S.

Does Pterygium Cause Astigmatism?—Hall, Geo. P., Houston, Texas. (*Texas State Jour. of Med.*, October, 1910.) After reviewing the prevailing theory as to the causation of pterygium, the writer says: "This membrane, as a whole, we can readily conceive is quite capable of making a smart traction on the cornea, quite enough to alter decidely the relative length of the two principal meridians." Patient, age 52, examination disclosed O. D. 20/xx, with + .50 cyl. ax. 150, = 20/xv. O. S., 20/xx, w. + .50 cyl. ax. 15 = 20/xv. Muscular balance seemed normal. Two years later the refraction of the right eye was found unchanged, of the left, 20/xx, w. + 1.50 cyl. ax. 90, left hyperphoria one degree. "The pterygium about 3 mm. on the cornea." "The left lens was now changed to meet the change in degree and axis of astigmatism, and the patient strongly advised to have the pterygium removed. This the patient declined." One year later the status of the left eye was found unchanged and the patient could use his eyes very little without pain and discomfort. The pterygium was then removed. Two months later the refraction was found as follows: Right eye unchanged: left eye, 20/xv, with + .63 sphere. The left hyperphoria had disappeared. The writer believes the pterygium responsible for the increased amount of astigmatism and the change in the axis, and that it also embarrassed the vertically acting muscles so as to superinduce a left hyperphoria of one degree.

M. D. S.

"What! Not Blind Yet?" Gould, George M., Ithaca, N. Y. (*Lancet-Clinic*, Oct. 1, 1910), reports a case of high myopis in a literary woman aged fifty, undercorrected by about five diopters, the astigmatism also being uncorrected. Using the case as an illustration he emphasizes the importance of neither undercorrecting or overcorrecting myopia, the

proper correction permitting a fair amount of use at near range under careful restriction, when no disease is present.

M. D. S.

Family Physician Refracting as a Factor in Medical Practice, and Its Promotion During 1910.—Connor, Leartus, Detroit (*Lancet-Clinic,* Oct. 15, 1910), says that a chair of optometry filled by a non-medical man has been established in Columbia University. He also quotes an optician who states practically that they (the opticians) expect eventually to treat eye diseases and their reflexes and perform ophthalmic surgery. Only four state medical examining boards require a working knowledge of refraction. Of the 135,000 physicians in the United States, not above 3,000 are able to refract. He believes it very disastrous to divorce one branch of medical practice and thinks it will invite the invasion of other branches by non-medical persons. He shows the progress which has been made toward the Michigan idea of physician refracting and gives the resolutions passed by various societies along this line. M. D. S.

On Some Unusual Reflex Phenomena.—Deutschmann, R., Hamburg. (*Beit. z. Aug.,* Heft 75, p. 246.) After a synopsis of the different types of paradox reaction of the pupils, formulated by Piltz (*Neurologisches Centralblatt,* 1902, pp. 939, 1012 and 1054), D. reports a case of true paradox reaction of the pupils to light: A woman, aged 69, suddenly lost the sight of her right eye. Ophthalmoscopically moderate papillitis with retinitis of the immedite surroundings was ascertained. The retinal vessels were ectatic with partly spindle-shaped thickenings, as found in arteriosclerosis. The circulation was preserved and there were no hemorrhages. Both pupils, of the same size, reacted normally and consensually. Four days later the right pupil showed the fololwing paradox reaction: It remained unchanged on intense illumination, but on removal of the light, i. e., on shading, it suddenly contracted energetically and then was dilated to its former size. The phenomenon subsided with the healing of the papillitis, and the pupil again reacted normally.

Case II. A man, aged 42, who 15 years ago had lues, no patellar reflexes, presented the fololwing peculiar recation: On illuminating the left eye the lower lid was raised, while the up-

per lid did not move. The same, but not as intense, was observed in the right eye, and in each eye consensually. The reflex did not occur on convergence and accommodation. D. could not find a similar case in literature. It could only be an incomplete reflex from the optic nerve, i. e., conveyed solely to the orbicularis of the lower lid, an isolated reflex transmission to that branch of the rami zygomatici of the facial nerve which innervates the lower lid. C. Z.

Transient Hypermetropia in Diabetes Mellitus.—Lundsgaard, K. K. K., Copenhagen (*Klin. Mon. f. Aug.,* 48, II, July, 1910, p. 38), enumerates the 11 cases so far published with the different views of the authors and reports 2 cases of his own. In his cases the diminution of hypermetropia was not, as generally supposed, dependent upon the decrease or disappearance of sugar. Repeated measurements with Schioetz's tonometer revealed that the changes of refraction could not be due to an alteration of tension, and those with Javal's Ophthalmometer that the curvature of the cornea was constant, so that the hypermetropia could not be produced by the cornea.

L. thus ascribes the development of hypermetropia to the lens, especially since both lenses of the second case showed opacities and vacuoles, and surmises that the changes of the lens which produce hypermetropia are in some way or other related to the changes which cause diabetic cataract.

Another relation of transient hypermetropia to cataract may be found in the suddenness, with which the former always, cataract frequently, sets in. L. further refers to some cases in literature in which incipient cataract gave rise to hypermetropia. He recommends to search for opacities of the lens in future observations. C. Z.

On the Ophthalmoscopic Examination in the Erect Image With Indirect Illumination.—Haab, O., Zürich (*Beitr. z. Aug.,* Heft 75, p. 314), illustrates on a number of cases the different influence of lateral illumination in the erect image upon the appearance of some formations on the fundus, especially the macular region. Thus foci can be rendered visible which otherwise, i. e., in the inverted or erect, directly illuminated, images can be seen only with great difficulty, or not at all. On the other hand, visible changes may, by lateral

illumination, assume a different aspect, which under circumstances makes them clearer and brings them out better.

For the first group H. gives the following explanation: If a dark spot in the retina disappears on direct illumination and appears dark or black on indirect illumination, the conclusion must be drawn, that an opaque stratum lies on its anterior surface, which in direct light appears white or greyish and reflects so much light, that the pigment spot behind it is not visible.

A dark spot may, however, be produced by indirect illumination in a different manner, without presence of pigment. A plate of whitish or greyish tissue in the anterior layers of the retina which reflects the light, appears in direct light as a light or greyish red or greyish patch, scarcely differentiated from the fundus. If the adjacent tisue is intensely illuminated the light will penetrate to a certain depth and will also illuminate some of the tissue behind that plate. This illuminated ground reflects light which is intercepted by the plate because it is almost or totally opaque. Consequently the plate will appear dark or light ground, although in impinging light it is lighter than the ground and even appears glaring white.

Or the indirectly illuminated place next to the formation in question may illuminate this obliquely from the side and partly transilluminate it. Thus shades and modellations, as illustrated in the second group, may come under observation.

The chief condition for the changes of appearance in direct and lateral lights is the site of the formations in different planes, either within the retina or optic nerve, or such, that the retina is detached from the underlying tissue and can receive from this reflected light either directly from behind or from the side. Thus the relations of position of different objects visible on the fundus, may be ascertained. C. Z.

The Accommodation of Presbyopes.—Amman, Winterthur (*Arch. f. Aug.*, 66, p. 272), studied these questions: (1) Does the accommodative contraction of the ciliary muscle cease at the moment it reaches the limit of its usefulness, i. e., at the point where the lens cannot assume a further curvature? (2) If not, does it quantitatively remain the same at the same range of accommodation when the lens still responded?

As the contraction of the ciliary muscle cannot be directly observed, A. ascertained it indirectly by the accompanying contraction of the sphincter and the muscles of convergence. He infers from the contraction of the pupil, which, also in presbyopes, increases the more the object is approached, that the contraction of the ciliary muscle is not limited by attaining the accommodation effect. By comparative tests of convergence in presbyopes and young emmetropes in approaching the object. A. found, by von Graefe's experiment of equilibrium in which during suspended fusion the innervation of convergence follows exactly the impulse of accommodation, in presbyopes the impulse of accommodation greater than the impulse for the same range of accommodation before the sclerosis of the lens. He also found that a young person presents the same over-innervation if the ciliary muscle, paralyzed by atropin, does not obey the impulse of accommodation, as the presbyope whose sclerotic lens does not follow the impulse. A. compares this to the overexertion one makes to force the lifting of a paralyzed limb.

The author thus formulates his observations: In presbyopes the innervation and movement of accommodation do not cease with the attainment of the accommodative aim. They do not pursue by augmentation a useful purpose, but spend themselves without benefit by increasing their power proportionately to the resistance without being able to overcome it. This is of practical importance as it explains the asthenopic symptoms occasionally observed in presbyopes, especially if they delay the wearing of proper glasses. C. Z.

RETINA.

Changes in the Macula in Latent Carcinoma of the Stomach.—Paschieff, C., Sofia. (*Arch. f. Aug.*, LXVII, 2, 3.) Pick, in his work on retinal changes in chronic anaemias in 1891, described 8 cases where there was retinal involvment in carcinoma of the stomach. One of these cases only was controlled by autopsy. He came to the following conclusions:

1. In chronic anaemias there may be retinal changes such as hemorrhages and foci of retinitis. They are very commonly seen in malignant tumors of the stomach.

2. The cause is not fully understood. It is probably toxic.

3. Transitory albuminuria may have similar retinal changes acompanying it.

The author's own observations were based upon the histological examination at autopsy of the eyes of a case of carcinoma of the stomach with metastases.

1. Carcinoma of the internal organs are not seldom accompanied by retinal changes.

2. These changes are varied in character. Besides hemorrhages and extravasation in the cerebral layer of the retina, there may be central pigment epithelial growth and degeneration of the neuro-epithelial layer. There is also no characteristic carcinomatous retinitis, but a retinitis in carcinoma.

3. These retinal changes are not proportional to the anaemia. It is on that account that the changes are not alone due to disturbed nutrition, but also to toxic processes. E. C. S.

The Significance of the Foci of Degeneration at the Macular Region Typical for Albuminuric Retinitis.—Schieck, F. (From the eyeclinic in the University of Goettingen. *Klin. Mon. f. Aug.,* 48, II, August, 1910, p. 150.) The ophthalmoscopic changes in diseases of the kidneys show differences in three directions: More or less swelling and inflammatory conditions of the disc, venous congestion with hemorrhages and fatty degeneration of the nervous substance, either associated or isolated. Each of these changes, however, may be found not exclusively in albuminuric retinitis, but also in a number of other affections. Twelve cases are reported of changes of the macula in the familiar stellate form, which are generally considered characteristic of the existence of a kidney disease, without signs of nephritis. Four were cases of choked disc, 2 of exudation under and in the retina, 1 of septic retinitis, 1 of luetic retrobulbar neuritis, 1 of Korsakoff's disease, 3 of unknown etiology.

Even very extended degeneration in the stellate form gives no unfavorable prognosis, and a complete restoration may take place, as illustrated in three of the above cases. S.'s observations prove that the stellate figure at the macula cannot be a sequel of sclerosis of the vessels supplying the macula. There must be other causes or else the speedy recovery in his cases could not be accounted for. If the conception should become strengthened, that the fatty degeneration at the macula is no

documentation of a kidney disease, but merely a reaction of the nervous substance to nocuous influences of various kinds, the assumption of Bordley and Cushing would gain in probability that in albuminuric retinitis similar elements play a role as in choked disc. The great difference between the now prevailing explanation of the genesis of albuminuric retinitis and the new one is that the affection of the retina is not considered as the direct consequence of the general disorder, but as a result of local disturbances due to the general disease.

C. Z.

A Case of Syphilitic Thrombosis of the Upper Nasal Retinal Vein.—Puscarin, Helene, Jassy, Romania (*Klin. Mon. f. Aug.,* 48, II, July, 1910, p. 45), shows in a short review of literature that the cases so far observed chiefly occurred in older persons from 50 to 80 years, from arteriosclerosis, marasmus, senile gangrene, or erysipelas of the face which at first caused orbital thrombophlebitis and then thrombosis of the central retinal vein.

Then the following case is reported: A man, aged 28, had a chancre 3 years ago, followed by secondard symptoms. He received 5 intromuscular injections of mercury 3 years ago, and 5 a month previously to the failure of sight of the left eye, which now was reduced to fingers at 2 mm. V. R. = 1. Aside from a few opacities of the vitreous, the media were clear. The optic disc, especially its nasal border was veiled, arteries very thin, veins enlarged. At the upper inner portion of the fundus down to the disc were 2 hemorrhages, surrounded by smaller ones. The adjacent veins, very much enlarged, of dark color, disappeared in the hemorrhages. At their emergence they grew very pale, scarcely discernible as far as the disc. The portion of the retina between the hemorrhages and their periphery was pale, yellowish grey and opaque. There were no hemorrhages at the macular region and at the periphery. Further observation was not possible, as the patient left the hospital.

C. Z.

SINUSES, NOSE AND EAR.

A Case of Bilateral Papilloedema and Ring Scotoma Due to Sphenoidal Sinusitis. Wood, C. G. Russ and Wallis, G. F. C. (*The Lancet*, Sept. 24, 1910.) The writers

report an example of this sort in which there had been defective sight for two years with intervals of improvement, severe frontal pains, papilloedema, divergence, tenderness on pressing the globe backward, contraction of field for white ond colors, no central scotoma. The inferior and middle turbinates were engorged and pus was seen upon the posterior extremities of the middle turbinates; the latter were removed, and the sphenoidal sinuses opened and mucopus found. Transillumination had been negative. Following these operations the fields showed marked improvement in the right eye; in the left eye there was complete annular scotoma, and in the small area of central vision, a relative scotoma for green; the latter disappeared later.

The diagnosis in this case was arrived at mainly by exclusion. The final result was recovery with good vision and cessation of the headaches. C. H. M.

Visual Fields in Accessory Sinus Disease.—MacWhinnie, A. M., Seattle, Wash. (*N. Y. Med. Journ.*, August 13, 1910.) The writer reports five examples of sphenoid and posterior ethmoid disease with charts which are characteristic and similar in every case before and after operation, and in a footnote states that since this article was written he has made perimetric charts of twelve additional cases, all of which show the scotoma which he describes. In the five cases reported and seven observed since, he has "failed to find a normal visual field, enlargement of the blind spot being the rule with isolated scotomata in the intermediate zone in the cases in which pus was demonstrated by the probe or was present in the middle turbinate region. In none of his cases had he demonstrated a central scotoma, whether pus was present, either before or after operation. In all of his cases in which pus, granulation, or mucocele became evident after operation there was a characteristic scotomata of the ring or annular type occurring in the intermediate zone, as well as an enlarged blind spot."

He considers this ring scotoma as typical of disease of this character, and states that one is justified in making such a diagnosis when such a scotoma is found, even when the retained infection is not evident to the eye or probe. These findings are at variance to the reports of all other writers who report normal visual fields. He believes it is good practice to open the

sphenoid in cases of optic neuritis or choked disc showing paracentral scotoma, no harm resulting if there is an absence of involvement of the sinus.

He closes his article with the following conclusions: (1) The central visual acuity may or may not be diminished, although it is usually lessened. (2) Normal visual fields without scotomata would indicate imperfect perimetric chart, hasty procedure, or indifferent taking of the same. (3) The absence of pus in the nose, with or without proptosis, does not indicate a normal sphenoid. (4) Relative scotomata for red or white are always present, regardless of whether the blind spot is enlarged or not. (5) Contraction of the field of vision always for red, maybe for white. (6) Scotomata disappear before the field enlargement takes place, following operative procedures. C. H. M.

Optic Nerve Affections Due to Ethmoiditis.—Schimer, Otto. (*American Medicine*, August, 1910.) The first case reported was of two days' duration, phlegmon of the orbit, due to the perforation of an ethmoidal empyema into the orbit. There was some venous hyperemia of the disc, the vision was reduced to recognizing movements of the hand. Immediate operation with establishment of free drainage resulted in the restoration of nearly normal vision at date of report, about four weeks after. In the second case the sight had been diminishing for about five months until able only to count fingers in both eyes, pupils slightly widened, temporal halves of both discs white. The middle turbinates were removed and the suppurating ethmoiditis treated. Three weeks later, one eye showed slight improvement. The writer concludes, "It is therefore of the utmost importance to think of ethmoiditis in cases of optic atrophy of unknown origin. The characteristic symptoms are considered to be in the onset diminution of central vision, pallor of the temporal halves of the disc and central color scotoma." M. D. S.

Otitis Media With Perisinuous Abscess and Paralysis of the Abducens.—Lehmann, Richard, Berlin (*Deut. Med. Woch.*, 1910, No. 29, p. 1368), reports a case which presented the typical complex of symptoms, at first described by Gradenigo in 1904, characterized by paralysis of the abducens in

acute (or chronic) otitis media. The mastoid and tympanic cavity were filled with granulations, and the bone was discased upwards to the dura down to the tip, in front to the meatus and backwards quite a distance. In exposing the sinus, which was covered by pulpy granulations, about 1½ teaspoonfuls of pus oozed.

The paralysis of the abducens was very much improved in the first three days after the operation, so that diplopia occurred only ocasionally. The wound healed in four weeks; the paralysis of the abducens had not completely subsided until after 10 weeks.

L. ascribes the paralysis of the abducens to the pressure by the abscess and to a circumscribed meningitis at the apex of the pyramid. The rapid improvement within the first few days after the operation is attributed to the relief of pressure. If this, however, had been the only cause, the paresis would not have persisted almost 10 weeks. Therefore the slowly recovering paresis must have been due to meningitis at the apex.

C. Z.

TOXICOLOGY.

On Optic Nerve Diseases Due to Poisoning With Organic and Inorganic Arsenical Preparations.—Schirmer. Otto, New York (*Arch. Ophthal.*, Sept., 1910, xxxix, 456), calls attention to the fact that a number of cases of optic atrophy have followed the internal administration of the organic arsenical preparations. He refers to Koch, who reported 23 cases of optic atrophy out of 1,633 patients treated with atoxylon. The author gives the detailed history of a case of optic nerve atrophy, following the use of atoxylon, that came under his observation and also gives the history of a case of atrophy of the optic nerve following the administration of arsacetin.

The author believes that, in all organic arsenical compounds of the atoxylon group, the primary drug is not the poisonous one, but that it is changed in the body by reduction into other compounds. He gives the following characteristic features of this form of atrophy: "Onset with haziness, scintillation, and contraction of the visual field, especially on the nasal side, the same as is found in quinine-amblyopia. The central vision remains fairly good until the field has become very narrow. The

optic nerve becomes pale with sharp boundaries in the majority of observations at an early date. There is contraction of the arteries at the onset and, in the later stages, when the disk has got quite white, both sets of vessels are extremely narrow. As a rule the atrophy runs a slow but progressive course. It takes months before the eye becomes entirely blind and this is avoided only in exceptional cases."

The author states that it is safer to give one large dose of the preparation instead of repeated weak injections. When the eye once becomes involved the atrophy continues until the entire nerve is degenerated. Schirmer has found only 6 cases of optic nerve affections following the use of inorganic preparations of arsenic and adds that the inorganic arsenical preparations damage the optic nerve only in exceptional cases, producing a retrobulbar neuritis which offers a favorable prognosis.

W. R. M.

Anylarsenates and Optic Atrophy.—Clarke, Ernest. London. (Report of June meeting of Ophth. Soc. of the United Kingdom. *Brit. Med. Journ.,* June 25, 1910.) The writer described two instances of optic atrophy following the use of anylarsenates in the treatment of syphilis, and pointed out that great care should be exercised in the administration of this remedy, that the dose should be carefully regulated according to the body weight and age of the patient, that it was doubtful if it ever was safe after 40, and that the eyes should be most thoroughly examined before and during the administration of the drug.

C. H. M.

On Three Cases of Intoxication by Spirarsyl, Alcohol and Sublimate With Post-Mortems.—Hegener, C. A. (From. the eyeclinic of Prof. W. Uhthoff in the University of Breslau. *Klin. Mon. f. Aug.,* 48, II, August, 1910, p. 211). A girl, aged 18, was treated for lues with subcutaneous injections of spirarsyl (arsensphenylglycin) in doses of 0.3 at intervals of from 3 to 6 days, 1.10 in all. Soon symptoms of a general severe intoxication developed with headache, vomiting, icterus, edema of the face and exanthema. The lids could with difficulty be opened passively. The pupillary reaction was prompt, central vision not essentially disturbed, visual field free as far as could be determined. Both discs were reddened and ill-defined, blood vessels abnormally filled.

Four weeks after the first injection the sensorium was disturbed, pulse accelerated, heart dullness enlarged, systolic murmur, traces of albumen, hyalin and granulated casts in the urine, liver enlarged; death after 6 days.

Microscopic examination of the yes: Slight edema of the disc. In the anterior orbital portion of the optic nerve intense accumulation of nuclear lymphocytes in the septa, especially the lamina cribrosa, around the vascular sheaths; vessels and retina unaltered. In this case the anatomical changes of the optic nerve, consisted in interstitial neuritis, and widely differed from the findings in intoxications by atoxyl and arsacetine, viz. degeneration of the optic nerve. Thus it might be assumed that spirarsyl is resolved in the body into entirely different action from that of the products of reduction of atoxyl.

The following case of alcohol amblyopia presented, besides the clinical picture at first described by Samelsohn, Vossius and Uhthoff, some peculiarities. A man, aged 32, coming from a family of potators, drank, for about 10 years, regularly one liter of gin daily. He showed intense tremor and hypesthesia of the legs to pain. V. of both eyes 6/lx, central relative scotoma for red and green in form of a horizontal oval from 5° nasal to 25° temporal, 8° upwards and downwards. This improved under treatment, but V. remained the same. The patient left the hospital after four weeks. On his return two weeks later the temporal half of both discs was distinctly pale. Soon after the patient left the hospital he committed suicide. The microscopic examination revealed neuritis of the papillo-macular fascicle, in some parts of the intracranial portion of the optic nerve and the center of the chiasm simple degeneration, extending to the tractus. In the anterior part of the optic nerve where the papillo-macular bundle lies at the periphery the pial sheath and its septa were markedly thickened. The septa of the papillo-macular bundle had a coarse fibrillar structure and occupied from two to three times the normal volume. Within this network of the septa the nuclei were augmented and numerous leucocytes were found. The nerve bundles were rarefied and shrunken, but the vessels not altered. The course of the papillo-macular bundle could be followed up by the described interstitial neuritic process. At the disc it commences as a temporal wedge, which farther back becomes

sickleshaped, behind the entrance of the vessels a vertical oval and gradually runs in the axis of the nerve to the chiasm.

This case seems to speak against the view of some authors that the process commences in the center of the retina and ascends in the optic nerve, as its intensity was greatest in the posterior portions of the optic nerve. This seems to indicate that it may primarily attack any part of the optic nerve and extend towards the center and the periphery and affect the retina secondarily. The intactness of the blood vessels showed that the degeneration of the papillo-macular bundle is not always due to a primary disease of the vascular wall, as some authors maintain. H. thinks that the affection of the vascular walls in some cases may be rather due to a participation of the vessels in the inflammatory processes in the optic nerve without being the primary cause of them, or occasionally a partial phenomenon of a general peripheral arterio-sclerosis.

The third case was a fatal intoxication by 3.50 sublimate without damaging the visual organ, clinically and microscopically, from which H. concludes that in intoxication by sublimate the visual organ is not affected. C. Z.

TRACHOMA.

On the Occurrence of the Prowazek and Halberstädter Bodies in the Normal Conjunctiva of Men and Apes.—Addariogrin, G. (*Arch. f. Aug.*, LXVII, 2, 3.)

In 1907 Prowazek and Halberstädter called attention to small bodies occurring in the epethelium of the conjunctiva of patients suffering from trachoma. These bodies they held were specific for this disease; claiming that trachoma was a pure epithelial disease, the follicle building being secondary to it. The bodies they classified as chlamydozoa. Later observers, however, have not all agreed with the above. The bodies have not only been found in normal conjunctivas, but they have not been constantly found in trachoma by competent observers.

The author examined the epithelium in normal individuals and found bodies resembling those described by Prowazek and Halberstädter. They appeared more often in young than old and in the cylindrical cells. E. C. S.

The Abode of the Prowazek Corpuscles.—Heyman, Bruno (*Wien. Klin. Rundschau,* May 8, 1910.)

The corpuscles which are found in cases of non-trachomatous conjunctivitis and in genital secretions, even when gonococci are present, are not reactionary products of the gonorrhoeal process, but a virus of a different nature, which can easily be transplanted on the conjunctivere of the newly-born and of the monkey.

Future experiments are to show whether or not this virus produces symptoms of disease if brought in contact with the eyes or the genito-urinary apparatus of the adult. J. G.

The Importance of the Chlamydozoae in Trachoma and Blenorrhoea.—Halberstaedter, S. v. Prowazek (*Wien. Klin. Rundschau,* May 8, 1910).

Trachoma has its origin in the epithelium of the genital region. In the treatment of trachoma we must pay attention to the chlamydozoae blenorrhoeae and to urethritis. J. G.

Remarks on Trachoma in Western Queensland.—Smith, Temple (*Australasian Medical Gazette,* Aug 20, 1910). This article calls attention to the prevalence of trachoma in Western Queensland, where not long ago a Brisbane ophthalmic surgeon reported that 90 per cent. of the school children had more or less unhealthy lids, and that 20 per cent. had permanent impairment of vision, and finds fault with the proposed measures to cope with the disease. These, it appears, are in the hands of the Education instead of the Health Department, and apart from the meager adoption of one or two of the specialist's recommendations, one of their measures has been to supply the teachers with ointments and lotions! Dr. Smith recommends, first, that the State Health Department should do the work and not the Education people, and, secondly, that travelling ophthalmic hospitals, as in Egypt (and first in Russia, we may add), should be started and sent round the trachomatous areas. F. P. M.

Subconjunctival Injections of Cyanide of Mercury in Trachomatous Conditions.—Smith, Lt.-Col., Amritsar (*Indian Medical Gazette,* August, 1910), refers to the paper he read at the Bombay Medical Congress, 1909, on the subcon-

junctival injection treatment of trachomatous pannus and corneal ulcers dependent on trachoma. Having observed that the treatment had also a powerful influence over trachoma of the palpebral conjunctiva as well, he has for the past year used it to the practical exclusion of all other remedies for treatment of trachoma. He uses 1 in 4000 solution of cyanide of mercury, 20 minims, after well cocainizing with 10 per cent. solution of cocain. He also gives a hypodermic injection of morphia. After about three hours oedema of the eyelids will have set in and there will be no pain. The injection is made above so that it may make its way all round and into the upper fornix. The oedema subsides in seven days. A second injection, if given, should be given in six days, as it is easier to give before the oedema has quite subsided. Three or four injections generally suffice "to cure the most obstinate cases of trachoma or pannus, whether the latter be trachomatous or not. This agent seems to me to act in one of two ways or possibly both: (1) As a direct poison to the trachoma granule, or (2) on the principle of Bier's treatment." F. P. M.

Trachoma Corpuscles.—Halberstaedter, v. Prowazek and Heyman, Prague. (*Wien. Med. Woch.*, July 30, 1910.)

The small granules found by Prowazek in fresh cases of trachoma, he called chlamydozoae and considered them the etiological factor in trachoma. These same granules were later found in certain forms of blenorrhoea neonatorum in the genital organs of the mothers of these babies and in the urethrae of men.

Transplantation of the chlamydozoae upon the conjunctivae of monkeys produced an exact clinical picture of trachoma.

The author, therefore, urges to pay particular attention in trachoma to the chlamydozoae in blenorrhoea and urethritis.

Heyman does not consider these corpuscles as a reactionary product of the gonorrhoeal process, but as a separate virus, which can be reproduced and transplanted to monkeys. J. G.

The Nature of Trachoma Corpuscles.—Herzog, A. (*Wien. Klin. Rundschau*, July 3, 1910.)

The trachoma corpuscles are identical with involutionary forms of the gonococcus of Neisser. These zoögleae continue to grow in the epithelial cells of the conjunctiva as intraepithe-

lial parasites by a symbiotic adaptation and thus cause the infection in trachoma. J. G.

Is Trachoma Caused by a Coccus Which Is a Mutation of the Gonococcus?—Halberstaedter, L. (*Wien. Klin. Rundschau*, Aug. 28, 1910.)

All the studies of the mucous membranes affected with gonorrhoea or trachoma showed a close relationship between the gonococci and the chlamydozoae. There exists the greatest possible difference in the morphologic and biologic nature of these two bodies. Whether trachoma is caused by a mutation of the gonococcus still remains to be proven. G.

The Social and Clinical Aspects of Trachoma.—Bray, Aaron (*American Medicine*, August, 1910), divides trachoma into four distinct stages, (a) the formative stage, (b) the acute inflammatory stage, (c) the stage of decline or cicatrization, (d) the post-trachomatous stage. He emphasizes the necessity of caution in regard to infecting others during the second or acute inflammatory stage. He believes that the disease runs a milder course and is less infectious in this country on account of cleaner habits and modes of living. He thinks there is over-vigilance in the government inspection, many cases being returned with only follicular conjunctivitis. He believes there should be a trachoma institute for education of the public on the disease, for providing free treatment, and for providing facilities for the study of trachoma. M. D. S.

TUMORS.

Tumor of the Adrenal Gland With Metastasis in the Orbit.—Quackenbos, Alex., *Boston (Arch. Ophthal.*, Sept., 1910, XXXIX, 478), gives the clinical history and pathologic findings in a case of tumor of the adrenal gland with metastasis in and about the orbit. The pathologic diagnosis, by Dr. F. H. Verhoeff, was metastatic neuroma malignum of the malar bone and orbit, probably primary in the adrenal gland.

The author gives the following characteristic symptoms, which are usually found only in infants or young children: "Ecchymosis of the eyelids, accompanied by exophthalmos, suddenly appears; it may be followed by growths about the orbit.

It is usually confined to one side. The glands throughout the body are apt to be enlarged. Examination of the abdomen may reveal a tumor in the region of the kidney, or a mass may be felt in other parts of the abdomen. The blood shows secondary anaemia. The urine is usually free from blood and albumen. Most of the reported cases have been under four years of age. The course of the disease is rapid, death resulting from cachexia and anaemia."

The author also calls attention to the following: "1. Tumors of the orbit in young children, especially if accompanied with ecchymosis of the lid, should arouse suspicion of metastatis from an adrenal growth. 2. The microscopic examination of specimens shows a characteristic rosette formation of cells. 3. This form of tumor arises from embryonic nerve cells of the adrenal gland."

The author believes these tumors to be similar in general nature to the so-called gliomata of the retina. W. R. M.

Contribution to the Knowledge of Pseudoglioma.—Hamma, A., Metz. (*Arch. f. Aug.*, LXVII, 2, 3.)

It is well known that glioma can be so closely simulated by other conditions in the eye that the diagnosis can only be made with the greatest difficulty.

Treacher Collins examined 24 bulbs which were removed in the Royal London Oph. Hosp. on account of glioma and found 7 of them were pseudoglioma.

Raab examined 20 cases, with 5 pseudogliomas and not the true gliomas for which the eyes were enucleated. Vetch found the same to be the case in 2 out of 24 cases. Greef and Schultze 4 mistaken diagnoses in 21 cases and out of 10 other cases only 6 were gliomas.

By the term pseudoglioma is meant only those cases which clinically cannot be differentiated from glioma. In most such cases there is detachment of the retina through diffuse or circumscript inflammation of the uveal tract. Often there is inflammation of the chorioid with pus pressing the retina forward. Glioma is also sometimes simulated by old cases of simple retinal detachment where all inflammatory processes have subsided and there is an excessive fibrous change in the retina. Occasionally tuberculosis of the chorioid has been diagnosed as

glioma, as has also sarcoma of the same, and subretinal cysticerens.

Author reports two cases, one in a baby of 2 weeks, the other in a girl of 9 months.

Both of these cases proved, on examination of the enucleated globes, to be accumulations of blood in the eye ball pressing the retina forward and the anterior parts of the eye—lens and iris—against the cornea. E. C. S.

A Case of Hydatid Cyst of the Orbit.—Reaney, Capt. M. Foster, I. M. S. (*Indian Medical Gazette*, June, 1910) records a case of this in an Indian musician, aged 45, not having anything to do with dogs. There had been pain in the left eye eight months, and proptosis one month, the eye being projected upwards and outwards. The lower lid was swollen. The vitreous was cloudy. The eye was enucleated and a thin-walled cyst attached to the optic nerve removed. It was proved to be a hydatid by the discovering of a typical scolex. F. P. M.

The Condition of the Retina in the Neighborhood of Chorioideal Tumor.—Napp, Otto (*Wien. Klin. Rundschau*, July 10, 1910).

The retina at times undergoes degeneration in the vicinity of chorioideal tumors, with the result that cyst like empty spaces are formed not unlike Blessig's vacuola in a senile retina. This is brought about by the retina changing into connective tissue and by circulatory disturbances. J. G.

Heredity of Glioma Retinae.—De Gouvea, Rio Janeiro. (*Annales d' Oculistique*, January, 1910.)

At the Heidelberg Congress of 1909, von Hoffman Jun related a case of double glioma of the retina, in a child of one year, whose mother had been successfully operated upon 28 years before for glioma of O. D. He quoted Wintersteiner's dictum that "no case of hereditary glioma had ever been recorded." No member present could recall such a case.

De Gouvea quotes two such cases from recent literature, one, his own; the other by Owen, in Moorfield's Hospital Reports for 1905, who cites the case of a female of 5 months, operated upon for retinal glioma in 1859. When grown up she had a child operated upon for glioma in 1898, by Ridley. This child's

sister was not affected, but when grown up had two children afflicted with retinal glioma, one operated on successfully, the other dying with the disease.

De Gouvea then cites the case reported by him in Rio de Janeiro, 1886, male, aged 2 years, glioma confined to temporal side of O. D., enucleated in 1872, with recovery. When 21, he was married to a girl with negative history of neoplasm. There were seven children, two of whom, the second and third, both females, had glioma of both eyes, one at 2 years and the other at 5 months, both fatal. In these cases the heredity was paternal, while in the Moorfield cases it was maternal.

S. L. Z.

VISUAL FIELD.

A Case of Bitemporal Hemianopsia With an Unusual Clinical History.—Zentmayer, Wm., Philadelphia. (*Ann. Ophthal.*, October, 1910.) A woman, aged 27 years, married ten years. Stopped menstruating eight years ago after birth of last child, and has not returned. The hemianopsia came on suddenly in 1890 and continued with some variations for nineteen years. The vision was variable, averaging about 20/1. The causation was believed to be a diseased pituitary gland. The patient died in 1909 of pneumonia, no autopsy could be obtained.

M. B.

Book Reviews

A Treatise on Diseases of the Eye.—Weeks. 944 pages, including exhaustive index of 28 pages. Lea & Febiger, New York. Price, cloth, $6.00.

This new American treatise on ophthalmology from the New York school is well written, sufficiently exhaustive and trustworthy for the practitioner of medicine, yet succinct enough to be a guide for under-graduates. More than the usual amount of pathology and bacteriology have been included, bringing the subject in general well up to the present knowledge. As regards illustrations, however, one would have been better pleased to see the text of this eminent authority more freely and better illustrated by original drawings and photographic reproductions. Many of the old familiar cuts are herein reproduced, among them even a number of the reviewers. Certainly in the next edition Dr. Weeks should remedy these defects. The illustration of instruments is likewise incomplete, and some that are shown are rather antique. The book is well printed and bound. It is recommended to the student. H. V. Würdemann.

Handbook of Diseases of the Eye.—Harry Caldwell Parker, M. D. Illustrated with 115 Text Engravings, Half-tone Frontispiece and 5 Full Page Chromolithographic Plates, with 26 Figures. F. A. Davis & Co., Philadelphia, 1910.

This handbook of 303 pages, bound in limp cover with rounded edges, is a convenient textbook for the medical student, coming in the same class as that of May, Veasey, Wood & Woodruff, Hanke, and many others. It is clearly written, freely illustrated, and is recommended for the purpose as above noted, for which it was designed by the author.

H. V. Würdemann.

Refractive and Motor Mechanism of the Eye—William Norwood Souter, M. D., Associate Opthalmologist Episcopal Eye, Ear and Throat Hospital, Washington, D. C. With 148 Illustrations. The Keystone Publishing Co., Philadelphia, 1910. Price $2.00.

This is an octavo of 353 pages and 148 illustrations, giving in a little more simple language that of Tscherning, Landolt,

or Graefe-Saemisch, and yet much more extensive than the textbooks on diseases of the eye, the description of vision, refraction, optics, methods of measurement, errors of refraction, and those of the motor apparatus. The work is commended for the student. H. V. Würdemann.

The Treatment of Cataract—Lt. Col. Smith, B. A., M. D., M. Ch., Indian Medical Service; Appendix by Capt. A. F. J. Lister, M. B., B. S., F. R. C. S., Indian Medical Service. Illustrations by Dr. Derrick T. Vail, Cincinnati, Ohio. Thacker, Spink & Co., Calcutta, India, 1910.

This work of 121 pages is the result of the author's personal experience of over 24,000 cataract extractions and their treatment. Coming as it does from a personage of such extensive experience as Henry Smith, this monograph is of special value to the ophthalmic surgeon. The author does not pretend to have made a well rounded up book from a literary standpoint; as one reads through the pages it will be seen that the book is the work of an inventive genius who has been little biased by precedent.

He classifies the forms of cataract according to the clinical standpoint and denominates the operation to which each variety is best suited, then deals with the Rawals' of India experience with couching of the lens, then describes extraction of cataract, which he denominates Daviel's operation, goes on to the treatment of immature cataract, and then takes up expression of cataract in the capsule, after-treatment of cataract operation and treatment, comparison to the intra-capsular and capsulotomy operations, description of the duties of the assistant and the after history of escape of vitreous, the latter chapter by Capt. Lister, who found there had been noted 500 escapes of vitreous out of Smith's 24,000 operations, and of these he examined 98 cases who had returned according to request.

Smith's method of extraction in the capsule is fully described and is illustrated by 51 sketches by Dr. Vail of Cincinnati. Practically all forms of cataract are dealt with by extraction in the capsule in preference to the capsulotomy method. Operators in America who have had a proper experience with the method of extraction in the capsule (the expression operation) are well satisfied with their results and believe it adapted, as does Smith, to the majority of cataract cases. The book should meet with good sale. H. V. Würdemann.

Accidental Injuries to Workmen, With Reference to Workmen's Compensation Act, 1906.—H. Norman Barnett, F. R. C. S., With Article on Injuries to the Special Senses, by Cecil E. Shaw, M. A., M. Ch., M. D., and Legal Introduction by Thomas J. Campbell, M. A., LL. B. Rebman, Limited, London, 129 Shaftsbury Avenue, W. C., 1909.

This medico legal work deals with a subject of vast importance which has been freely discussed during the last decade in European countries, but which, despite the extraordinary number of suits for compensation for damage in the law courts, and the great growth of the accident insurance business, has not taken up the attention of medical, legal, and manufacturing men to the same extent in America.

England passed the germs of legislation of protection for the working men in the time of George III, then followed the Employers' Liability Act in 1880, the Workmen's Compensation Acts of 1897, 1900, and 1906, under the protection of which some 13,000,000 people in the United Kingdom pursue their callings.

In the old days the common law afforded but a poor protection for the working classes; whilst it held the master liable for his own personal negligence, he was not liable for his servants and workmen. While the design of the framers of the act to keep it away from the lawyers has not been a brilliant success; only 13 cases were settled by regular arbitrators, 9 by special arbitrators, while 1209 issues came to the county court judges.

Description of the English laws' definition of accidents, of injuries to those predisposed to or suffering from diseases, making of reports and giving of evidence is described in the legal part of the work. Then the various signs and prognosis of injuries to the bones, joints, muscles, blood vessels, organs of special sense, internal organs, nervous system, and other parts of the body are described in a manner that should be clear even to a lawyer and should not admit of quibble as to definitions. The balance of the book is taken up by appendices, giving the text of the English Workmen's Compensation Act of 1906, a list of industrial diseases, reports of committees, etc.

This book is of particular importance to surgeons, as well as to the legal profession, and is recommended for every medical library. H. V. Würdemann.

The Prescribing of Spectacles—Percival, A. S., M. A., M. B., B. C., Camp Senior Surgeon Northumberland and Durham Eye Infirmary. Author of "Optics," "Notes on Optics," and "Practical Integration." Illustrated with Diagrams. 159 pages. Price 5/6 net. Published by John Wright & Sons, Bristol.

This, the latest of Dr. Percival's works, will occupy a prominent place amongst treatises dealing with this branch of Ophthalmology. The subject is treated as a mathematical science and therefore the work does not come within the category of a handbook for those who desire a short cut to a rough and ready means of spectacle prescribing. For all that, there is no reason why they should not read it, as it will disimburse their minds of the not uncommon idea that anyone with but a scanty knowledge of the subject can prescribe glasses correctly. Though only a small work of 159 pages, its perusal demands earnest study, as the author with his mathematical way of solving problems prefers formulae and figures to explanatory lines of text. Hence arises difficulty in places in being able to quite follow the reasoning laid down by the author.

As an advanced tutor to those who are well grounded in the science of optics, the theory of lenses and prisms, the work will come as a great boon. We are glad to see the importance paid to the subject of prism prescribing and to see at the same time the warning he gives against indiscriminate ordering of the same.

He also very wisely lays stress on the importance of examining for and correcting hyperphoria, which is a subject, as he correctly says, more often overlooked than overtreated.

Nearly a quarter of the book is given up to the optical side of the subject and this part alone makes the book of exceptional value.

The whole shows originality and is plainly the result of years of painstaking study and observation. As usual, the publishers have produced the work in a manner which leaves nothing to be desired. A. A. Bradburne.

Handbook of Physiological Optics.—von Helmholtz, H. Third Edition, supplemented and edited by Prof. W. Nagel, Rostock, in conjunction with Prof. A. Gullstrand, Upsala, and Prof J. von Kries, Freiburg. Vol. III. The Doctrine of the Visual Perceptions. Edited by Prof. J. von Kries. 564 pp. with 81 illustrations in the text and 6 plates. Hamburg and Leipzig. Leopold Voss, 1910. 24 M.. $6.00; Leather, $6.65.

In our review of the first volume of this famous work, in *Ophthalmology*, April, 1910, p. 555, the general plan and the principles were set forth, according to which the new edition was prepared. The third volume contains the doctrine of the visual perceptions and has been edited by J. von Kries, who by his numerous original investigations in this particular line was especially qualified to accomplish the difficult task most admirably. Also here the text of the first edition by von Helmholtz is reproduced, with indications to the original paging, and each of the following chapters supplemented by additions by von Kries: On the ocular movements, the monocular field of vision, the direction of seeing, perception of different depths, binocular diplopia, conflict of the visual fields. This is followed by a very elaborate essay by von Kries on the arrangement in space of the things seen, especially their dependence on congenital formations and experience, subdivided in general remarks on the nature of the conception of space, on the normal relations of localization, on changes of localization in anomalous positions of the eyes, on learning and losing the faculty of seeing, on the physiological substrates of judging and learning, on the origin of the laws of ocular movements.

Of special interest is the chapter on empirism and nativism, in which the editor propounds what in this field can be asserted with fair certainty and what, according to the present state of our knowledge, is not accessible to a definite judgment. The accurate meaning of the expression "nativism" is more clearly defined and the laws governing the whole of these phenomena are termed morphological. The problem is thus designated: To unravel on the one hand the significance of the principles fixed by morphological laws, on the other, of processes subserving the general laws of exercise, and to gain insight into the manner of their co-operation and complementation. Von Kries considers his views, in their ground character, as empiristic in spite of what he recognizes as probable with regard to morphological bases. He especially emphasizes that von Helmholtz's empirism, although demanding some modifications and commendations, has given the leading thought which even today forms the essential part of our conceptions of these problems and the foundation for further researches.

A new chapter on the theory of binocular instruments concludes the work, in which von Kries completes the physical

views arrived at by others by an excellent presentation of the physiological relations.

The handsomely gotten up volume is adorned by a portrait of von Helmholtz. C. Zimmermann.

Hemophilia in Ophthalmology, with Remarks on Hemorrhagic Infiltration of the Cornea.—Vossius, A., Giessen. Sammlung zwangloser Abhandlungen aus dem Gebiete der Augenheilkunde. By A. Vossius, 20 pp. Halle a. S. Carl Marhold, 1910. M., 0.75. 35 cents.

At the instance of a case, Vossius studied the literature of this peculiar disease very carefully and gives an excellent review of it, which will be read with great interest. The history of hemophilia in V.'s case, a woman, aged 36, who suffered from bilateral serous irido-chorioiditis with posterior synechiae, was not revealed until after an iridectomy had been performed. This was followed by relapsing hemorrhages into the anterior chamber which soaked the dressings for several weeks. The hemorrhagic infiltration of the cornea completely subsided within four months, much faster than in other cases published.

C. Zimmermann.

Handbook of Human Physiology.—Nagel, W., Professor, Rostock, in conjunction with numerous collaborators. Volume IV, Third Part of Second Half, 200 pp., with 52 illustrations in the text, and Supplement, 183 pp. with 18 illustrations in the text. Braunschweig, Friedrich Vieweg und Sohn. 8 M. $2.00. Supplement, 7 M. $1.75; Leather, 9 M. $2.25.

The 200 pages of this last instalment of Volume IV contain the splendid exposé of M. Cremer on the general physiology of the nerves. In the introduction on the anatomical structure of the nerves, in which the interpretations of the significance of the tissues composing the nerves by different authors are given, Cremer remarks that the controversy between neuron and fibrillae theory is of minor importance for the general physiology of the nerves, while they receive their full significance in considering the influence of the central organ on nervous processes or the embryologic relations as well as regeneration and degeneration. Then the fundamental vital properties of the nerves are discussed: Conductibility, metabolism, and the chemistry of the nerves; mechanical, thermic, chemical, and electric excitation of the nerves, and the influence of temperature on it; the electric current in the nerve at rest, seat and amount of electromotor power, negative wave, polariza-

tion of the nerves, the theories of the process of conduction in the nerves, changes of irritability by electric currents and finally by the law of contraction and its explanation, with a list of the most important handbooks and monographs on physiology of the nerves.

The first essay of the supplement is by H. Boruttau on blood and lymph, originally planned for the first volume. Not being intended to be a complete hematology, everything essential on the subject is given, according to the latest researches, in three chapters; the first on qualities of the blood as a whole: density, reaction, color, coagulation, viscosity. The different methods of ascertaining the circulating quantity of blood of the healthy adult are presented in detail.

In the second chapter, on the formed elements of the blood, the red blood corpuscles with regard to dimensions, number, properties; coloring matter, hemoglobin and its combinations and derivities, the chemistry of the coloring matter of the blood and its products of decomposition, crystals, etc., are discussed in detail, then the white corpuscles and the blood-plates. The third chapter deals with the blood plasma, serum and the processes of coagulation. To the chapter on lymph, tables on the quantitative composition of the blood, blood corpuscles, plasma, serum, lymph and the behavior of the blood at different ages of life are appended.

The second essay is a very good one on entoptic phenomena by Alfred Lohmann. The remainder of the volume contains up-to-date additions to the other volumes by the respective authors and an alphabetical index to the whole work. Quite interesting are the supplementary remarks of O. Weiss on the secretion and efflux of the aqueous, in which his experiments are described in detail. He laid special stress on the relations of the intravascular to the intraocular pressure, a factor so far neglected by former investigators. Weiss concludes that the assumption of a continuous current in the aqueous has become desultory.

With these volumes the handbook of human physiology is concluded. As mentioned in our reviews of the preceding volumes (*Ophthalmology* I, p. 841; IV, pp. 389, 794, 797; VI, p. 336), its chief object is the physiology of man, and the physiology of animals has only been drawn upon as far as the latter serve in experiments as substitutes for man. Those subjects

which are of greatest interest to the physician have been given larger space. The single articles have been written by authors who by their original researches have become famous in their particular fields. They are admirable in their completeness, with due and critical consideration of various views, history of research and an abundance of references, including the most recent literature, and enabling the reader to pursue his studies still further. Thus a splendid authoritative work has been created which represents the modern state of physiology, equally welcome not only to the physiologist, but to the zoologist, anatomist, psychologist, ophthalmologist, aurist, etc., and not least to general physicians, who constantly are confronted with physiological questions and will derive special benefit from such an exhaustive work.

The external appearance of the work, paper, print, the numerous illustrations, plates, and binding display the well known superiority peculiar to the publications of the renowned firm.

C. Zimmermann.

Exophthalmic Goiter.—Sattler, H., Professor, Leipzig. Basedow's che Krankheit; Graefe-Saemisch, Hondbook der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 160, 161, 196, 197.; pp. 385 to 667. Leipzig. Wilhelm Engelmann. 1910. Subscription 8 M. $2.00.

These instalments contain the relations between exophthalmic goiter and diabetes, polyuria, albuminuria, and a bibliography of 3210 numbers. Then the various forms of Basedow's disease are discussed, the complete and incomplete. S. emphasizes that not the number but the characteristic grouping of the symptoms determines the diagnosis. These are considered in detail, headed by the remark of Charcot, "Without tachycardia there is no Basedow's disease," then the course of the disease, the chronic and, generally fatal, acute forms, the induction of the latter by various manipulations on an uncomplicated struma and from acute thyreoidism from ingestion of thyreoidal preparations, duration, termination, prospects of recovery, succession of symptoms, influence of sex, Basedow's disease in childhood, distribution of the disease, disposition to it and its occurrence in animals.

Also these parts of Sattler's admirable work, like the preceding (reviewed in *Ophthalmology* V, p. 369, January, 1909), are pervaded by a spirit emanating from unusual experience,

critical knowledge and remarkable familiarity with literature up to date, and are written in a very fascinating style.

C. Zimmermann.

The Poisonous Animals.—Taschenberg, Otto, Professor of Zoology in the University of Halle a. S. **A text-book for zoologists, physicians and pharmacists. 325 pp. with 68 Illustrations. Stuttgart. Ferdinand Enke. 1909. 7 M. $1.75.**

This valuable book is an expansion of the lectures of the author held in the University of Halle as "publicum," i. e., for all classes of students, and addresses a wider circle of readers. The author being a zoologist, the zoological standpoint is, of course, predominant and the toxicological and medical questions are treated according to views of recognized authorities, collected from literature. This feature makes the work especially useful for physicians who wish to enter into the subject more closely and are thus spared the trouble of gathering the desired information from a widely scattered literature not easily accessible.

Those animals are defined as poisonous which constantly or temporarily contain in their whole bodies or in certain organs, and generally by their metabolism produce, substances which by their chemical nature are under certain conditions capable of damaging more or less severely other animals, and especially man, in their health or relative wellbeing. They are described in detail under the following headings: Animals which exert a poisonous action by their metabolism or regressive products; animals with poison apparatus; animals which contain poisonous substances in all parts of the body or in single organs, without secreting them; animals which assume poisonous qualities through their nourishment; animals who may act as poisons in an unknown manner. Within these groups the animals are discussed from the lower to the higher orders. Numerous illustrations of animals and of the mechanism of the poisonous organs facilitate the understanding.

Although the book is termed by the author a textbook, it is written in a most fascinating style, conveying an abundance of important information, and intensely arousing the interest of the reader. It is very handsomely gotten up and deserves the widest circulation.

C. Zimmermann.

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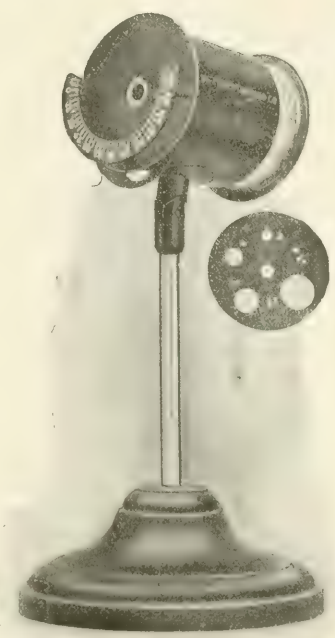

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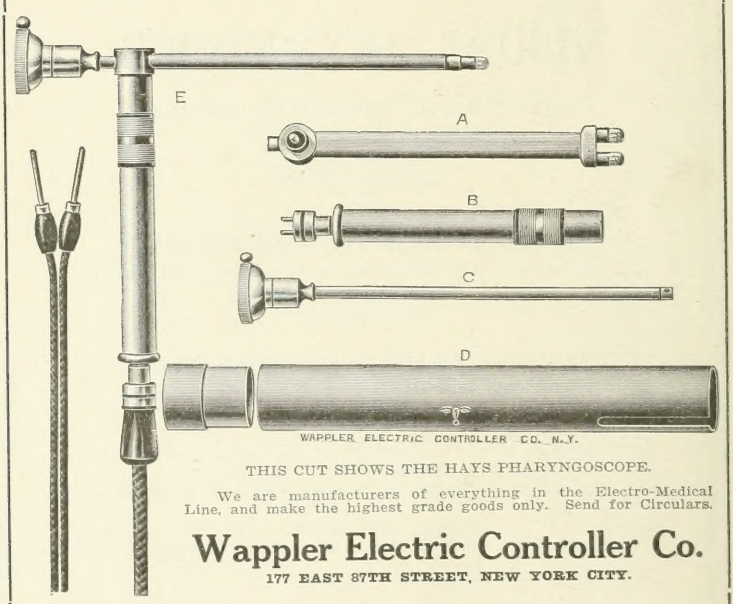

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